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VALLEY TOWNS OF CONNECTICUT.

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The surface of Connecticut may be said to repeat, to a certain degree, the surface features of the country at large on a smaller scale: a wide valley with the main river in the centre, and mountain ranges in the east and west. But unlike its larger counterpart, the Constitution State offers the strange case of a river and valley not continuing partnership to the end; below Middletown, the Connecticut *Valley* continues southwest towards New Haven, while the Connecticut *River* intersects the crystalline upland, forming a narrow gorge, through which it winds its solitary way southeast toward Old Saybrook. Thus it happens that the largest river of New England has been of almost no importance for the development of the country in that part of its course in which other rivers have been most important for the same—namely, in its lower course. It is, perhaps, the only river of its size which has not at its mouth a seaport proportionate in commercial importance to that of the country which it drains. If Hartford may be called the St. Louis of the Connecticut River, it is in vain that we look for its New Orleans. The functions of that port are divided between New Haven, which controls the entrance to the Valley but has no river, and Saybrook, which controls the mouth of the River but has no valley. This anomaly is one of the principal causes why, in Connecticut, the settlement of the country never proceeded to any extent upstream from the mouth of the river. The Saybrook Plantations never made any acquisition of territory upstream, but remained a pure trading colony under a royal patent similar to the Dutch colonies, until the Valley towns, realizing the importance of a complete control of their waterway, acquired that

territory by purchase; and for the same reason the commercial aspirations of New Haven suffered cruel disappointments until the means of modern traffic opened up for it a direct communication with the hinterland.

The term Connecticut Valley, as used in this paper, is, then, understood to be distinctly different from the valley of the Connecticut River proper. It applies to the topographical and geological unit represented by the area of Triassic sandstones and traps which extends from the Massachusetts-Vermont line to the Sound as a lowland of varying width, but coincides with the valley of the present river only as far as Middletown. This configuration of the country explains the distribution of the people. The founders of the "Towns upon the River" (Windsor, Hartford, and Wethersfield) and of Springfield, Mass., came from Massachusetts Bay. The voyage thence round storm-beaten Cape Cod was so perilous, and the season for navigating up the river on which ships might freeze in during five months out of twelve was so short, that, in spite of the dangers of the wilderness, almost all travel and traffic between the mother and daughter colonies was by land. As a highway to the ocean, on the other hand, the river was of little value to those early settlers who had come, not for commercial purposes, but in search of homes. Consequently these towns, in spite of their location on a splendid waterway, grew up as a distinct *inland* colony whose area was coextensive with the cultivable land in the Connecticut Valley, and the connection of this outpost of civilization with the world outside was, not by what would appear the natural way, the river, but eastward overland. Neither the country nor the settlements on the Sound were as yet of any practical interest to them.

New Haven, in her turn, had just as little desire or need to establish a connection with the River Colony. The two had nothing in common but their strong love of independence, which only intensified the effects of the existing geographical barriers. The founders of New Haven had strong commercial interests. Coming directly from England, the shore was the natural location for a first settlement, because it offered them the best facilities for trade with, and eventual return to, the mother country. They looked and travelled eastward across the ocean, not northward toward their sister colony. Moreover, between them and the latter there extended many miles of low, swampy country which did not invite settlement or traffic, and not until the growth of New York and Boston required a regular connection between the two great ports was there any need of establishing roads through this region. Thus the two colonies grew farther

and farther apart during the first decades of their existence, and New Haven might form another Rhode Island by itself to this day had not the necessity of seeking allies against a common foe brought them together at a comparatively early date.

In studying, first, the colony on the River, we must not limit ourselves to the towns south of the present State line. This line cuts through both a geographical unit and a unit of settlement. Springfield, Windsor, Hartford, and Wethersfield were settled under the same conditions, by the same set of pioneers from the same mother colonies, before any political boundaries had been drawn in this vicinity. All four of them were founded, as the settlers believed, under Massachusetts jurisdiction; all four extended over, and adapted their configuration to, the Valley lowland; all four of them convened at Hartford, until an arbitrary line drawn by one who had never set his foot on Connecticut soil separated what belonged together by law of nature. The course of the State line was therefore an object of controversy for many years, and the present line still shows visible traces of it. Connecticut ultimately regained at least part of the Springfield territory—viz., the present towns of Enfield (End-field) and Suffield (South-field). But the consequences of the unnatural separation are still felt, especially in regard to the important problems of river navigation, where State jealousies have always been the greatest obstacles to radical improvements required by the best interests of both Commonwealths: an instructive example of how far man is from being helplessly dependent on his geographical environment; the most favourable conditions will be of no use to him unless he knows how to avail himself of them, just as well as it is possible for him to assert himself in spite of unfavourable ones.

This divergence of the actually existing conditions from the geographic postulates, which always forms one of the greatest charms of anthropogeographic investigation, gives a special flavour to the political geography of America, for it is more pronounced here than in any country of the Old World. While in the latter we observe man emerging slowly and gradually from the state of slave to that of master of geographic conditions, America offers the unique spectacle of a race of masters who, suddenly and without any transition, supplant a primitive race of slaves of nature, a top layer, so to speak, being superimposed upon a bottom layer, with a wide gap between. This master race, this top layer, brings to the new soil the results of the training of centuries on the old; it applies and tests them on conditions under which they never worked before. We must, therefore,

expect to obtain results often quite different from what we would conjecture in Old-World anthropogeography, and, where the results are alike, it will be a strong argument in favour of the postulates.

The Connecticut Valley is a very thankful object for such studies. It is really a double valley, being divided into two unequal parts by the chain of trap ridges which extends from New Haven to Holyoke and beyond. The valley east of the ridges has the present river; it will therefore be designated by the name of River Valley. The valley west of the ridges has at present no connected watercourse; its line of lowest depression is divided up among several smaller watercourses running in different directions but leading practically nowhere. According to its drainage it may be divided into two parts in its turn: the northern part, generally speaking, drains into the Connecticut by way of the Farmington River, and its southern limit is, approximately, the town of Cheshire; we shall designate it as the Farmington Valley. The southern part drains into the Sound by various small rivers converging more or less toward New Haven, and it will be called the New Haven Valley (Fig. I).

This natural division into an eastern, or River Valley, western, or Farmington Valley, and southern, or New Haven Valley, we shall find repeated in the political history of the Valley settlements.

The first colony took its origin in the River Valley. The four towns which belonged to it—Springfield, Windsor, Hartford, and Wethersfield—grew up as products of the topography left by the work of the Springfield Lake and the rivers succeeding it. What opportunities did this region offer to the founders of the towns? There was a large river in the middle of it, bordered on either side by alluvial meadows; beyond them the country rose in echeloned terraces of clay or sand; beyond these, on either side, rose a more or less steep escarpment covered with forest, the "wilderness" in which unknown dangers were lurking. The river offered fish and a convenient way of travel between the settlements on its banks; the meadows, arable land for fields and pasture for the cattle; the terraces, desirable sites for houses in the vicinity of the former and yet out of immediate danger from the freshets; the wilderness was a region to be avoided. Consequently, the borders of the wilderness were selected for the east and west lines of the towns; at right angles to them, with the River in the centre, the north and south lines were drawn, so that each community might have an equal share of the respective advantages of the different parts of the Valley, and so the four original towns came into existence as four strips of land, of approximately equal shape, lying north and south of each other on

both sides of the River, like so many pearls on a string (Fig. II). It is very significant, and ought to be mentioned here with due

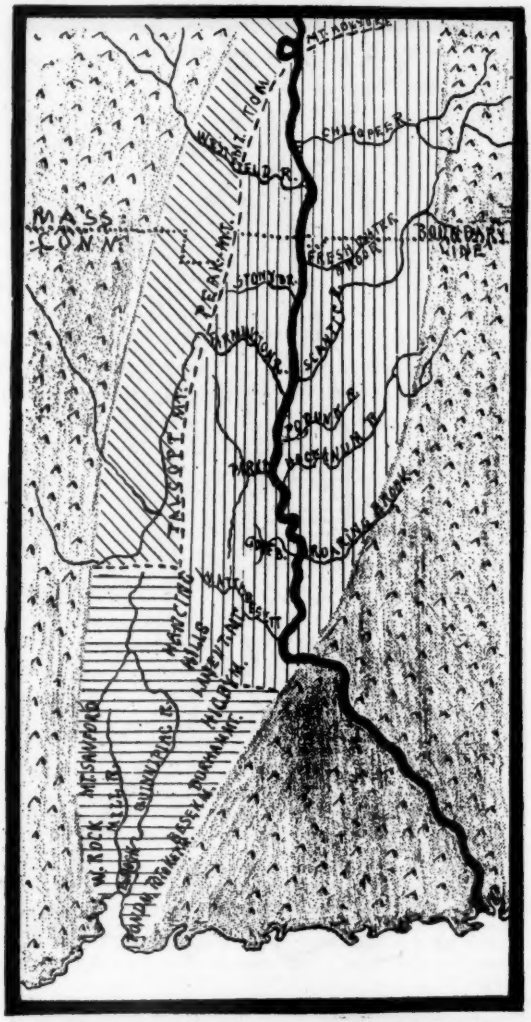

FIG. I.—PHYSIOGRAPHIC DIVISIONS, CONNECTICUT VALLEY.
III RIVER VALLEY. ☰ NEW HAVEN VALLEY. \\\ FARMINGTON VALLEY.

emphasis in regard to general anthropogeographic discussion, that the thought of choosing the river for a boundary between the towns

does not seem to have ever entered the minds of the settlers. There is no trace of even a suggestion to that effect in the reports on the

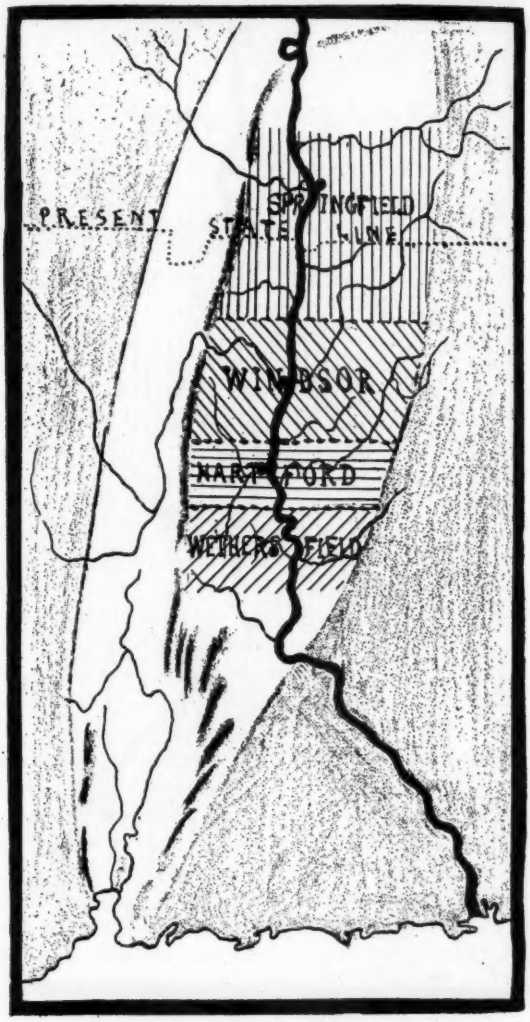

FIG. II.—ORIGINAL TERRITORIES OF THE FOUR VALLEY TOWNS.

work of the boundary commissioners. They seem to have instinctively acted in accordance with the law that mountains, not rivers,

especially not the large navigable rivers, are the natural boundaries of the expansion of man.* The large river is an artery of life for the country through which it flows; the similarity of the country on its banks creates a community rather than a diversity of interests between the occupants thereof, to say nothing of the interests represented in the river itself: navigation, fisheries, etc., which are common to the inhabitants of both shores. Moreover, a large river is a surface rather than a line, and for this reason alone would be ill fitted for the function of a boundary, since the layout of the line along the *talweg* is subject to constant change. The Franco-German boundary along the Rhine was an anomaly, due to ungeographic political influences, and so are other similar boundaries, unless the nature of the river itself makes it an obstruction to, instead of a means of, traffic. On the Connecticut River, where none of those unnatural conditions were encountered, the geographical law could assert itself to its fullest extent, and thus we find that every town on this river, not excepting those farther down in the gorge, originally included the land on both sides of the same.†

With small streams and brooks the case is different. They often are, in fact, nothing but a wet line in the country, and for this reason were, here as well as elsewhere, quite frequently chosen as convenient lines of demarcation between the settlements. Beaver Brook and Pewter Pott Brook are mentioned among the early boundaries of Wethersfield; the same is true of Roaring Brook in Glastonbury; of Kettle Brook in Windsor; of Podunck and Pewter Pott River in East Hartford; of Longmeadow Brook, Freshwater River, and Saltonstall Brook in Enfield; of Three Mile Brook in Suffield, etc.‡

Between the small brooks which separated, and the large River

* A striking example of the barrier effect of mountain ranges, of a more local character, is given by the town of Newington. Although this town was settled as a colony of Wethersfield, and all its leading families are descendants from the old aristocracy of Wethersfield, there is almost no connection, material or immaterial, between the two towns, on account of "the Mountain" (Newington or Cedar Mt.), which extends between them (Fig. III). Owing to the particular configuration of the Connecticut trap ranges (gentle slopes on the east, abrupt descents on the west side), it was easy enough for the colonists from Wethersfield to go beyond the range westward; but for the Newingtonians the way east up the steep ascent on their side of the range was too much hardship to be made more often than was absolutely necessary, and as soon, therefore, as the territory of New Britain and Berlin was developed, the life and business of the town followed the line of least resistance downhill, so that all its vital interests are now connected with those two towns which originally were quite alien to it.—(Private communication.)

† Cfr. likewise the grouping of the states above each other on both banks of the Nile, and, as an illustration of the penalties paid by man for the violation of geographical laws, the inconveniences arising from the fact that, at the mouth of the Hudson, the two banks belong politically to two different States.

‡ Cfr. Ratzel, Anthropogeographie I, 2d. edition, p. 350: "On the lower Zambesi, Livingstone found the territories of the smaller chiefs bounded by the small rivers, while the mighty Ma Kololo, and after their extermination, their language, spread on both sides of the main river."

which connected, the settlements, the medium-sized tributaries of the latter fulfilled a function of their own: they *determined the location of the centres of settlement.* The peninsula formed at the mouth of a side stream and the main river offers, if the former is of sufficient size, a strong position for defense, than which no better could be found in those days of constant danger from Indian attacks. In every case, therefore, with the only exception of Wethersfield, where the Indians at first were friendly to the settlers, the settlement of the territory between the two wildernesses started from such a peninsula. The classical example is the mouth of the Park River,

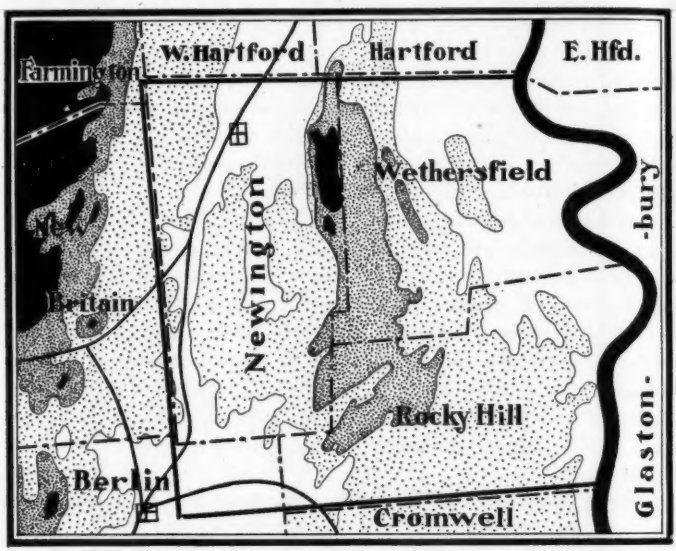

FIG. III.—THE TOPOGRAPHY OF NEWINGTON, CONN. THE HEAVY BLACK LINE INDICATES THE ORIGINAL TERRITORY OF WETHERSFIELD.

where the Dutch planted the first habitation of the white man that was ever built in this region, the Fort of Gode Hope; and the English founders of Hartford, finding the best location already taken, thought even the second best superior to all others, and began to build their houses a little farther upstream, but still on peninsular ground (Fig. IV). The Palisado of Windsor, the nucleus of the later town, likewise was erected at the junction of the Farmington and Connecticut Rivers (Fig. V), Springfield was founded at the mouth of the Agawam, from which site only the flooding of the very low delta caused the settlers to move to the higher bank opposite; in

East Windsor, the first houses stood near the mouth of the Scantic, and in East Hartford near that of the Hockanum River; the beginnings of Middletown, in later years, started from the mouth of the Mattabesett. The similarity of the geographic function of these

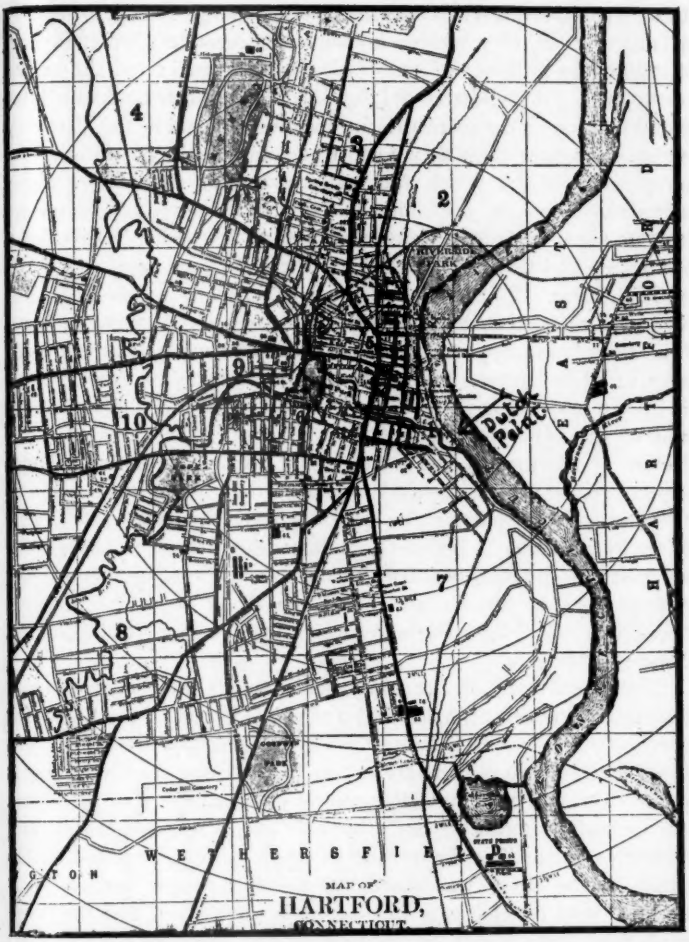

FIG. IV.—HARTFORD, CONN. THE BLACK LINE SHOWS THE RECTANGULAR BLOCKS IN THE OLD, AND THE DIVERGING AVENUES IN THE NEW, PARTS OF THE CITY.

rivers is strikingly expressed in the similarity of their names: in each town the tributary appears on the records as the "Little River," in opposition to "The" River, which means the Connecticut—a charac-

teristic illustration of the supreme importance of the latter, whose unique relation to the settlements needed no epithet to distinguish it from others.

In proportion as the need for immediate protection decreased, the Little Rivers assumed new functions. Being large enough to support a limited traffic, they became influential as secondary waterways in directing the progress of exploration and expansion of the settlements toward the wilderness* (Fig. V). Along their banks the later pioneers moved mountainward, and they were repaid by the discovery of beavers whose skins they could trade, and by the possibilities for industrial pursuits which the water-power of the Little Rivers afforded. Sawmills, gristmills, and similar industrial plants sprang now up along these banks, and what used to be the Little River of a town soon had this name changed to the now more appropriate one of Mill River. This name has survived in many instances to this day, even after steam and electricity have to a large extent replaced the original water-power plants. The objectionable features, however, of a location on a more or less shallow stream made serviceable to human interests have increased with the increase of the population and of the industries themselves, so that in most cases the Mill Rivers of the present are indicative of parts of the town whose aspects can be pardoned only by studying the present in the light of the past. The popular name of Hog River for Hartford's Little River is significant. Hartford, on the other hand, has been very successful in rescuing at least part of it from the curse of outliving a once glorious mission, and her Little River now well deserves the appellation of Park River, by which the youngest generation has come to know it.

The distribution of the town lands among the settlers which determined the characteristic features of the layout of the towns for ever after was similarly influenced by geographical facts. It was based on these two considerations: each proprietor must have access to the river, and each must also receive an equal share of the fertile but unhealthy meadow, and the less productive but safer and healthier "upland," as the terrace was then called. The land on the banks of the River was therefore divided up into narrow tiers, strips of land running east and west from the River, and the occupants built their houses on the bluff of the "meadow hill" (=first river terrace), where they were within easy access to their fields and yet out of danger from freshets. This arrangement of the houses in its turn determined that of the streets and highways. In the

* Cfr. Ratzel, Anthropogeographie I, No. 154: die Flüsse als Wege.

earliest days of the colony, when through-traffic could hardly be spoken of, the main function of roads was to connect houses. The

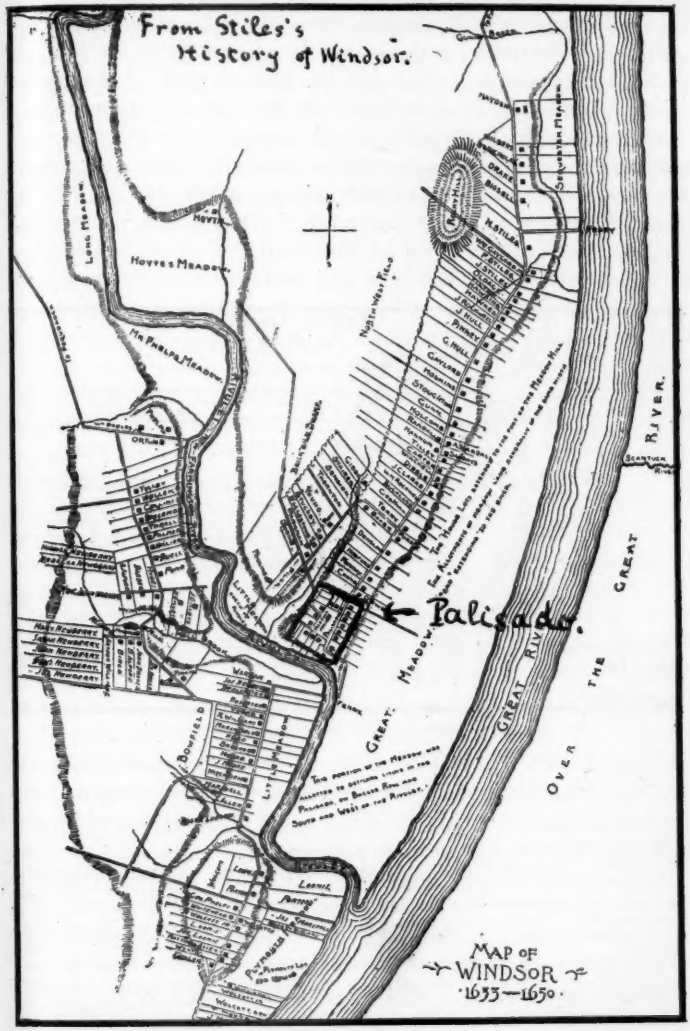

FIG. V.—WINDSOR, CONN. THE RELATION OF HOUSE LOTS TO MEADOW AND TERRACE.

latter being arranged as they were, a street connecting them could not but run more or less north-southward and generally parallel to

the River; and this is exactly what the main streets of the valley towns did and still do. Later, when the country farther inland was parcelled out, this mode of distribution had become an established custom: another tier of narrow strips of land succeeded the first on the second terrace, with another street parallel to the first and to the River, and so forth until the plateau back of the highest terrace was reached (Fig. V, VI). By this time the settlers seem to have had enough of this enforced submission to the whims of topography, for on the plateau we find the streets laid out in all possible ways and intersecting each other at any imaginable angle. The maps of the present River towns offer, therefore, an arrangement of their streets which is almost the direct reverse of that of other cities. Their old quarters have long parallel thoroughfares cut up

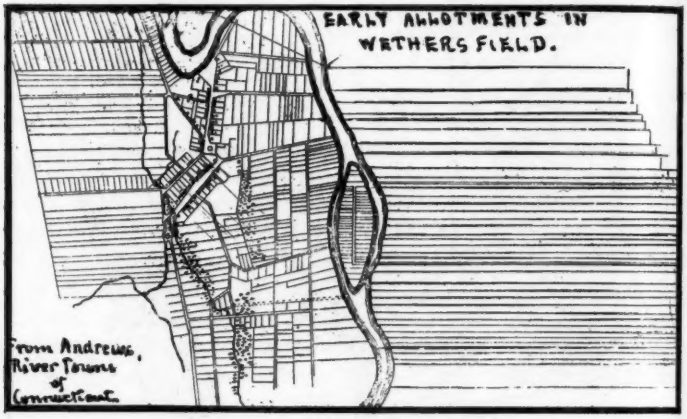

FIG. VI.—SERIES OF TIERS IN WETHERSFIELD, CONN.

into more or less rectangular blocks by short side streets, while the new residence districts are characterized by a striking irregularity in the arrangement of their thoroughfares—a circumstance which certainly has much to do with their picturesqueness (Fig. IV).

In the early days the progress of settlement was more rapid on the western than on the eastern bank, because the latter was mostly open meadow land and the former more wooded. The lands on the east bank were, therefore, at first utilized for pastures only, and are often distinguished as "Farms" from the town proper: Windsor Farms or East Windsor, Naubuck Farms or East Wethersfield, and the like. By and by, however, what people called over-population in those days obliged them to extend the settlement to these less attractive parts of their territory. The topography of both banks

being the same, the established method of land distribution was applied again; but in the meantime the colonists had learned in their old homes that the first terrace was, after all, somewhat too near the water to insure perfect safety from its dangers, and therefore, the pioneers on this bank started settlement from the *second* terrace. The first street, consequently, runs on the second instead of the first terrace on the east side. It also differs from the main street on the west side by its being very wide and straight; for at the time when it was laid out through traffic had already begun between Hartford and Springfield. Under these conditions the street was not laid out from house to house, but with a definite purpose independent of which future houses might be built on it.* Its unique role as compared with other streets is shown, as in the case of the Connecticut River, by the use of the definite article: it is "the" Street of the towns through which it runs, even now. In East Hartford alone another street accompanies it on the first terrace, and this is easily explained by the fact that there alone the east bank had been found originally free from wood or brush and that therefore this region had been settled at about the same time as the western bank, and on the same plan. East Hartford is, therefore, the only town on the east side whose oldest houses stand on the brow of the "meadow hill," and where the main street, following the gentle curves of the River, offers a variety of picturesque perspectives which all the imposing layout of "the" Street farther north is unable to give.

In the New Haven Valley conditions were entirely different. The whole country was very low, the meadows were mostly tidal marshes. No large river had remodelled the glacial deposits, which, so near the ocean, had probably never been undisturbed long enough to develop anything like terraces. The only location with a future was on the coast, and thus New Haven was from the start predestined to a much more dominating position among the neighbouring

* There is one instance on the west side, too, of a street existing prior to the settlement. This is Suffield, the original southwest corner of the town of Springfield. Of all towns bordering on the river Suffield is the only one which has no alluvial meadow land, owing to the fact that the underlying sandstones crop out directly on the bank of the river, whose bed is here cut into bed rock, forming the Enfield Rapids or "Falls" on the other side. Lacking that which the early settlers prized most, this district remained a wilderness until quite late into the eighteenth century, in the midst of a thriving commonwealth, and it was known generally as the "country on the road to Northampton." But when the traffic with that town became more lively the advantage of a location on a main highway offered compensations for the lack of alluvial soil, and along the street, the then straight street, the village and later town sprang up. Its inhabitants soon found out, too, that the rich glacial soil was no less desirable for agricultural purposes than the meadow land, and the town of commercial origin is indeed to-day one of the few which have preserved their rural character in spite of the industrial invasion of modern New England, thanks to its flourishing tobacco-fields. Fig. VII, whose outlines will also apply to any village on "the" Street on the east side, shows very clearly how far the configuration of a typical street settlement differs from that of one founded regardless of commercial considerations, such as the three original towns.

towns than Hartford ever held in the Connecticut Colony. New towns were founded, indeed, east, west, and north of the harbour town; but their relation to New Haven was submission to a powerful leader rather than a partnership of equals, as in the case of the "Towns upon the River." The founders of New Haven town found no meadow hill to build houses on; the only somewhat healthy locations for home-building were the little hills formed through the intersection of the lowland by the small streams. One of these hillocks, between two creeks filled up since, was selected for the New Haven town plot, which was scientifically laid out into nine squares with all the rigid economy that the scarcity of space required, meadow lots being allotted away from the houses outside of the settlement proper (Fig. VIII). From this centre the town and later city spread out in all directions, so that its map has now a distinct star-like aspect, quite unlike the rather fan-shaped outlines of cities like Hartford or Springfield (Fig. IX).

From these two nuclei of settlement a lively colonizing movement started about the middle of the seventeenth century—a movement which worked toward bringing the boundaries of the two nearer each other, without as yet establishing any direct contact. The River towns began to investigate what was back of the wilderness that enclosed them on the west; the shore town pushed farther north. The former crossed the trap ranges and discovered another valley with a river and terraces similar to their own, though not so wide; the latter discovered other habitable spots rising from out of the marshy lowland. Thus Windsor colonists crossed the mountains and founded Simsbury; Hartford people, Farmington; Wethersfield penetrated beyond the Rocky Hill into what is now Middletown, and beyond Cedar Mountain into Newington; in the north, Springfield, with the assistance of a considerable contingent of pioneers from her southern neighbours, laid the foundations of Westfield, Hadley, and Northampton. The geographic conditions of the daughter towns repeat those of their mothers: Middletown, Northampton, and Westfield are terrace towns, Simbury and Farmington likewise nestle on a strip of high land "on the slope of the mountain between forest and meadow." The offspring of New Haven, on the other hand, Wallingford, is another example of a village laid out carefully on the limited space of a small elevation, in this case on one of the lower-sandstone ridges which crop out from under the marshes, along and across which the lines of the streets and house lots were drawn with the same mathematical accuracy with which the foundations of the mother town had been established.

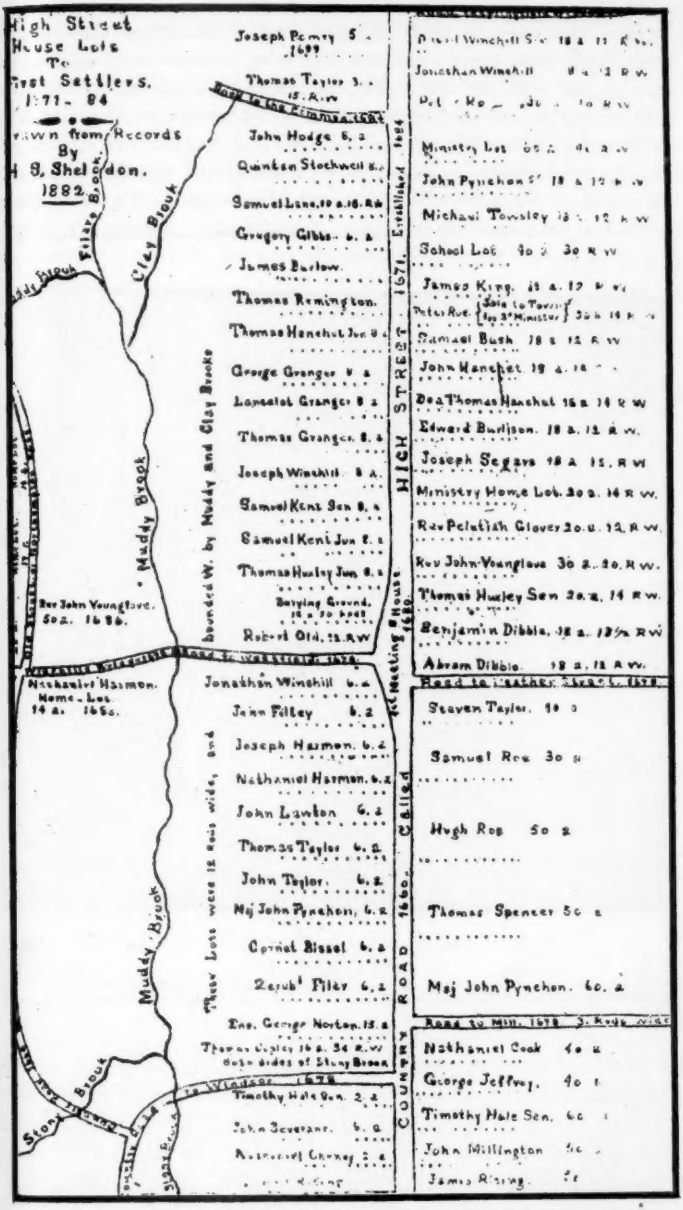
High Street
House Lots
To
First Settlers.
1671-84
Drawn from Records
By
H. S. Sheldon.
1882
Clay Brook
Muddy Brook
Bounded W. by Muddy and Clay Brook
HIGH STREET 1671. Established 1666
Joseph Pomry 5 a. 1699
Thomas Taylor 3.. 15 A.W
John Hodge 6. 2
Quintin Stockwell 6..
Samuel Lane, 19 a. 16 Rd
Gregory Gibbs 6. 2
James Barlow
Thomas Remington
Thomas Hanchet Jun 8 a
George Granger 8 a
Lancelot Granger 8 a
Thomas Granger, 8. a
Joseph Winchill 8 a.
Samuel Kent Sen 8. a
Samuel Kent Jun 8. a
Thomas Huxley Jun. 8. a
Burying Ground. 14 x 20 feet
Robert Old, 12 A W
Rev John Younglove. 30 a. 16 Rd.
Nathaniel Harmon. Home Lot 14 a. 1660.
Jonathan Winchill 6. a
John Filley 6. 2
Joseph Harmon. 6. 2
Nathaniel Harmon. 6. 2
John Lawton 6. 2
Thomas Taylor 6. 2
John Taylor. 6. 2
Maj John Pynchon, 6. 2
Cornet Bissel 6. a
Zerubb Filer 6. 2
Ens. George Norton. 15. a
Thomas Ogden 16 a. 34 R. W
both sides of Stony Brook
Timothy Hale Sen. 2. 2
John Severance. 6. a
Nathaniel Cheney 2. a
Meeting House 1680.
Road to Windsor 1678
COUNTRY ROAD 1660. Called
Muddy Brook
Stony Brook
Jonathan Winchill 18 a 11 R W
Jonathan Winchill 8 a 12 R W
Ministry Lot 60 a 4 a W
John Pynchon Sr 18 a 12 R W
Michael Towsley 18 a 12 R W
School Lot 40 a 30 R W
James King 18 a. 12 R W
Peter Roe Sold to Town for 3d Minister 30 a 16 R W
Samuel Bush 18 a 12 R W
John Hanchet 18 a. 12 R W
Dea Thomas Hanchet 16 a 16 R W
Edward Budison. 18 a. 12 R W.
Joseph Segars 18 A 12. R W
Ministry Home Lot. 30 a. 16 R W.
Rev Peletiah Glover 20. a. 12. R W.
Rev John Youngloue 30 a. 20. R W.
Thomas Huxley Sen 20. a. 14 R W.
Benjamin Dibble. 18 a. 12½ R W
Abram Dibble 18 a. 12 A W.
Road to Weather Field 1678
Steven Taylor. 18 a
Samuel Rose 30 a
Hugh Ross 50 a
Thomas Spencer 50 a
Maj John Pynchon. 60. a
Road to Mill. 1678
Nathaniel Cook 40 a
George Jeffrey. 40 a
Timothy Hale Sen. 60 a
John Millington 50 a
James Rising. 50 a

FIG. VII.—SUFFIELD, CONN. THE RELATION OF HOUSE LOTS TO THE PRE-EXISTING STREET.

A political map of the colonies at the close of this first period of expansion would then show the following aspect: Two individual colonies, one with its centre of gravitation on the Sound, the other in the meadow and terrace district of the Connecticut River and its tributaries. Both are enclosed between the uplands east and west, the former reaching north as far as Wallingford, the latter extending south as far as Southington and Middletown. Between them was a low and swampy territory, uninviting for settlement, which formed a natural barrier between the two colonies on the area now

FIG. VIII.—THE ORIGINAL TOWN LOT OF NEW HAVEN, CONN.

covered by the towns of New Britain, Berlin, and Meriden (Fig. X).

An outside impetus finally closed the gap between the two spheres of interest. In 1686, when the appearance of Governor Andros threatened the independence of the colonies, the court of Connecticut made a hasty grant to the existing towns of the hitherto unoccupied lands both on the western hills and between the colonies, to avoid being compelled to surrender them to Andros. The actual occupa-

tion of these grants well illustrates the difference between central and peripheral locations. It took over thirty years before the present towns of Litchfield, Harwinton, and New Hartford grew up on the outskirts of the Connecticut colony; while the border country at the foot of the Hanging Hills, in spite of all its objectionable features, soon began to feel the quickening influence of a location half-way between two thriving commonwealths. In addition to that, the

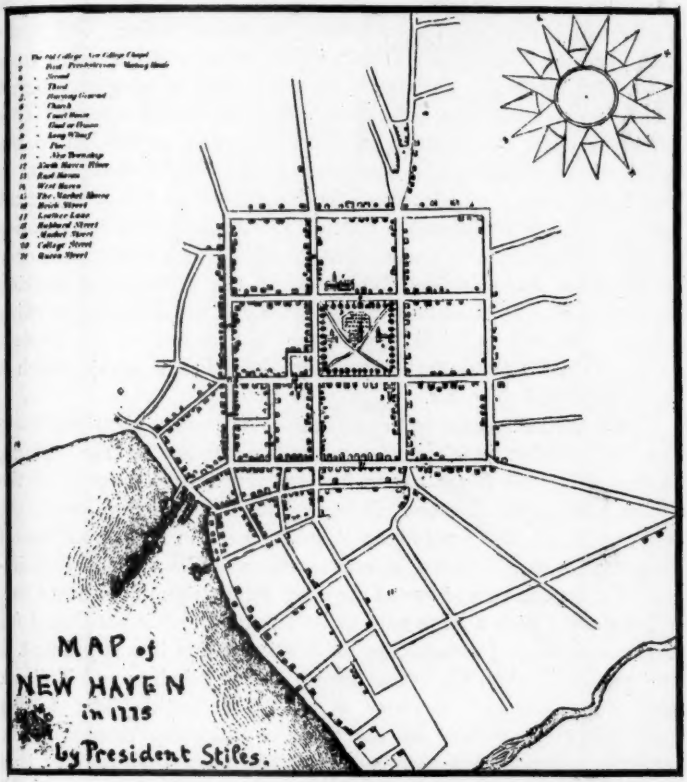

FIG. IX.—MAP OF NEW HAVEN, SHOWING THE AVENUES RADIATING FROM THE ORIGINAL CENTRE.

greater advantages of through traffic made themselves felt, since New Amsterdam had become New York, and the need of an overland connection between it and the other great centre of English colonization on the Bay had led to the establishing of a stage route between Boston and New York. Under such conditions it did not take long before the first houses of the present town of Meriden

sprang up in the neighbourhood of a famous tavern which stood here for the accommodation of travellers between the two metropolises; and the development of this town is another instructive example of the influence of location. Both colonies took their share in it. It was founded under Connecticut jurisdiction and settled by Connecticut people from the adjacent towns. But it is the only instance of people from that State building, not a terrace town, but a hill town on the New Haven plan; for on this territory of New Haven-ish configuration their traditional method would not work. Old Meriden, like Old Wallingford, stands on a sandstone ledge rising from out of the lowland. Very soon even the political allegiance began to be felt as something incongruous with their environment. One after the other the freemen of Meriden began to petition to the court of Wallingford for admission as citizens of that town, so that before long the majority of the inhabitants of this Connecticut place were New Haveners politically. At last this discrepancy made the situation so untenable that the village as a whole went over to the other side as a New Haven town—one of the most striking instances of the attraction of geographical relationship working against arbitrary political conditions. The aspect of the present town line still reflects the uncertainty of conditions under which it was established (Fig. X).

In the border district on the east the controversies about the State line had similar results. Along the escarpment of the upland, settlers from the River towns had reclaimed the territory of the towns of Somers, Vernon, Bolton, Tolland, Coventry, from the wilderness, but those adjoining Windsor were in a state of almost perpetual change between Massachusetts and Connecticut jurisdiction. On the occasion of one of the many regulations of the State line, Windsor lost such a large part of its territory that it petitioned for a compensation. In compliance with this petition it was granted as an "equivalent" "all the vacant land between Windsor and Tolland, and the unoccupied territory north of Tolland." The former extended the boundary of the town considerably eastward; the latter was found, upon examination, to be just a small gore of land extending from the town across the upland to the Willimantic River. This gore, which was popularly called the equivalent, afterwards went with the eastern part of the town when this was set off as a separate town by itself, and so the new town received a shape not unlike the letter L, from which even its name of Ellington is said to be derived (Fig. X).

The land was now occupied all over. Its population increased

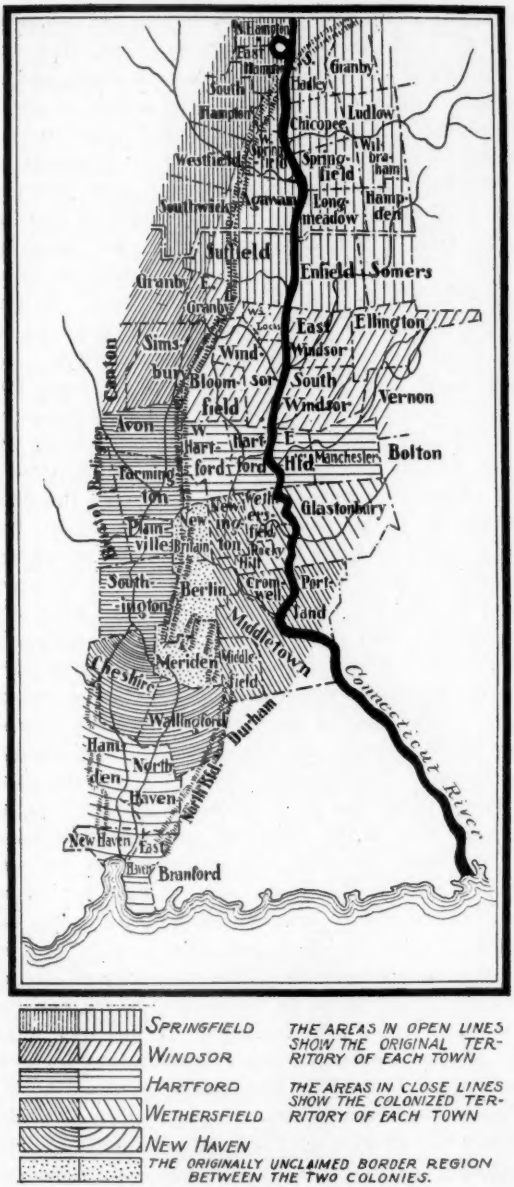

FIG. X.—HISTORICAL RELATIONSHIPS OF THE TOWNS.

and spread more evenly over the whole territory of the towns in proportion as the wilderness lost its terrors. Tier after tier of lots was laid out farther and farther away from the River, and the inhabitants gradually began to realize the true extent of the territory, which, in spite of owning it so long, they had never really occupied. At this point of the development another geographical law began to work—the law that each political unit can grow only to a certain size, which must be in harmony with geographical postulates: if it exceeds this limit it will fall apart. It is the same law which worked against the permanent existence of empires like those of Charlemagne, of Napoleon the First, or the "holy" German-Roman empire of the Middle Ages: In their times the influence of space—sheer space—yet unconquered by steam or electricity, was a force which man could not overcome, and all these huge foundations tumbled over as soon as the sceptre of a mighty tyrant no longer held them forcefully together. Even this country would never have been able to remain one union had not its making coincided with the age of steam, for which the distance between the Atlantic and Pacific ceased to be an obstacle to communication. But in the early days of which we speak here, with only most primitive methods of communication, space was the inexorable enemy of large political units. The Connecticut towns, when settled to their full extent, soon found out that they could not hold their own against it. Their territories were too large for the times, and consequently the same process of disintegration which destroyed the large empires set in here. Thus at the close of the eighteenth century another period of the foundation of new towns began, not by colonisation, however, but by *segregation*. The people of the peripheral parts of the towns found it inconvenient, and even impossible, to travel so far and so often as their duties at the town hall and meeting-house required. One after the other, therefore, the settlements in the outskirts of the towns petitioned to the Town court, at first, for "winter privileges"—viz., permission to have a pastor of their own during the part of the year when travelling caused the greatest hardship; later, for permission to segregate from the town church altogether and constitute a permanent parish by themselves; finally, for transformation of the parish into a separate town. In this way Hartford fell apart into Hartford proper, West Hartford, and East Hartford, from which, again, Manchester is an offspring; Bloomfield, Windsor Locks, Vernon, and East Windsor segregated from Windsor, and East Windsor had to give up Ellington and South Windsor in its turn; Glastonbury, Rocky Hill, and Newington were daughter towns

of Wethersfield; Middlefield, Cromwell, and Chatham, of Middletown, and Portland in its turn of Chatham; Simsbury lost Canton and Granby, and the latter, East Granby; Farmington: Avon, Bristol, Plainville, and Southington; where the three towns of Farmington, Middletown, and Wethersfield met, the settlers of this border region constituted themselves into a town of their own and called it Berlin; in the north, West Springfield, Suffield, and Enfield were taken from Springfield, and Somers from Enfield; in the south, East Haven, North Haven, and Hampden from New Haven, and Cheshire and Meriden from Wallingford (Fig. X). The immediate motives of these separations varied in the various places. Sometimes, as in the case of South Windsor, the long distances within the town are expressly referred to as the cause of the desire for a division of the town. In other cases the same cause can be indirectly traced, because the large original territory of the town included districts of very different natural opportunities, from which a diversity of occupations, and consequently of interests, among their inhabitants resulted which it was next to impossible to represent in one town government. For such reasons industrial Plainville seceded from agricultural Farmington; Windsor Locks, the manufacturing village on the Enfield Canal in the town of Windsor, from that town; in Massachusetts, Holyoke from West Springfield.* As a third group by themselves must finally be classed certain separations which were not due to any geographical influence—namely, those caused by religious dissensions among the members of a church, especially when that most prolific of all sources of New England church troubles, the location of a new meeting-house, was involved. Berlin and New Britain, where one church was successively removed to three different places according to the opinions of the party that happened to gain the upper hand in the controversy, are the classical cases of such emancipation from the mother church and town (Farmington). Granby, Canton, and East Granby present similar cases with regard to Simsbury; West Springfield took its origin as the unruly daughter of the Springfield church.

The whole territory being now divided up into a number of towns of fairly equal and manageable size, the nineteenth century found the

* In some respects Holyoke is, perhaps more than any other Valley town, the product of its terraces, which have each been utilized for the building of a canal corresponding to the respective levels of the river above and below the falls (now the Dam). But the rapid growth of this ultra-modern business town (founded in 1850) has not allowed the gradual occupation of the territory and the leisurely development of the residence districts. It is, therefore, the only terrace town in the Valley where straight streets and rectangular blocks dominate even on the highest terrace, a type perfectly out of harmony with the geographico-historical environment, due to artificial growth under a nineteenth-century boom, instead of gradual conquest of, and adaptation to, natural conditions (Fig. XI).

communities ready for the struggle for prominence, and soon the differences of their geographical conditions started among them a process of natural selection whose consequences have determined the present political geography of the country. In the century of steam and electricity there was, of course, no factor more potent in the determination of geographical values than the development of commerce and traffic, and a glance at the map of Connecticut will show that all towns and cities of any importance are found along the main lines of travel by rail or by water. The oldest of these

FIG. XI.—HOLYOKE, MASS. AN EXCEPTION FROM THE TRADITIONAL TYPE OF A TERRACE TOWN.

lines, whose influence began to work at the earliest date, was the waterway on the River. On it there were the five towns of Springfield, Windsor, Hartford, Wethersfield, and Middletown. From the very start Hartford enjoyed among them the invaluable advantage of a central location, which means that it was able to communicate with its neighbours in less time than any of the other four could with theirs, as illustrated in the diagram below. Supposing the five places *S, Wi, H, We, M* (Fig. XII), to be located on a line of traffic which, for the sake of convenience, may be represented as a mathe-

matically straight line with equal distances between the five points, and, counting the distance units between each two places, the peripheral location will, in the case of *S*, necessitate a trip of one unit to reach *Wi*, of two to *H*, of three to *We*, of four to *M*, and in the case of *M*, of one to *We*, of two to *H*, of three to *Wi*, of four to *S*; in all, both of the peripheral places will have to provide for a trip of ten units in order to communicate with all their neighbours. The semi-peripheral *Wi* and *We* are better off already. They can each reach two of their neighbours by means of one unit, the next by two units, the last by three—total, seven units to reach the same number of four towns. But *H*, thanks to its central loca-

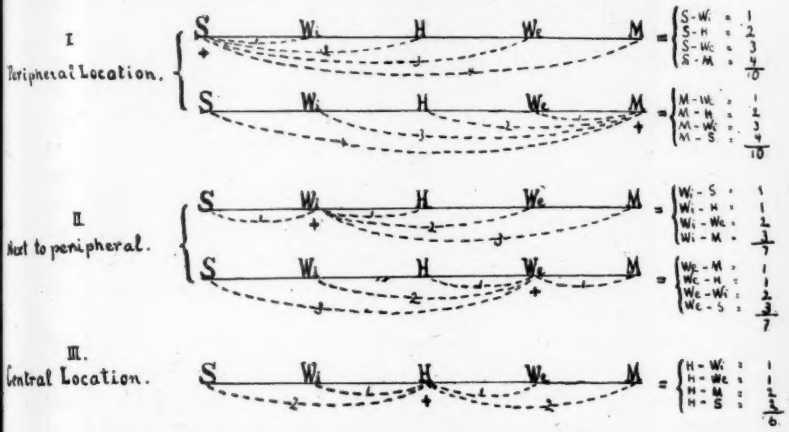

FIG. XII.—DIAGRAMS ILLUSTRATING COMMERCIAL OPPORTUNITIES OF RELATIVE LOCATION.

tion, needs one unit only to reach *Wi* and *We*, and two to reach *S* and *M*—total, six units, in comparison with the seven of *Wi* and *We*, and the ten of *S* and *M*. Both Springfield and Middletown, controlling the valley from one side only, were, therefore, from the start at disadvantage in the competition with the other towns whose opportunities upstream and downstream were nearly or entirely alike. In addition to this one-sided position with regard to the valley towns, Springfield was further handicapped by its location above the last rapids of the River, over which vessels were able to go only under exceptionally favourable circumstances, so that in the very infancy of the colony a warehouse had been built at the foot of the "Falls" to store goods for re-shipping from the large river boats to the small sloops that could be towed upstream, or in many cases for land-transportation to Springfield by way of "the" Street. This

was an obstacle which practically cut the city off from a large territory which she might otherwise have controlled; and even the construction of a canal around the Falls could not entirely overcome it. The political separation from the towns below as created through the unnatural course of the State line mentioned before gave additional weight to it, and thus Springfield interests and activities gradually confined themselves more and more to its neighbours on the north, where she soon secured the leadership which it was impossible for her to acquire among Connecticut towns.

But for Middletown there was no such compensation. To the disadvantage of its general position in regard to the Valley Towns was added the detriment of a hinterland practically without any settlers or commercial attractions. Back of the town extended, to the south and east, the uninhabited upland; to the west, the swamps of the border region between the two colonies. It was, in fact, cut off from the rest of the world save for the one way of access and egress—the River, which, as has been shown above, was only of limited commercial value below the meadow districts. Quarrying and fisheries were, therefore, the principal resources of the town for many years; and even in our times, that have given it better opportunities through the development of railroads and manufactures, the nickname of the "graveyard of Connecticut" has not quite lost its meaning.

Thus the race for prominence on the River was narrowed down to the three sister towns of Windsor, Hartford, and Wethersfield, and it was now Windsor and Wethersfield that held a peripheral location in comparison with Hartford, presenting an example of Hahn's law hardly less illustrative than the famous case of Bremen, Hamburg, and Lübeck. At first, indeed, it seemed as if Windsor had the brightest prospects, having become, with the increasing draught of vessels, the head of navigation on the River. But, unfortunately, the process did not stop there, and when vessels went on increasing, the head of navigation again moved downstream. Hartford was in possession of a topographical advantage unequalled for miles up and down stream—namely, on its territory the first terrace extends directly down to the river, forming a bluff overhanging the water that affords a safe landing at all seasons (Fig. XIII). To be sure, a ledge of rock at Rocky Hill in the town of Wethersfield might have offered similar facilities; but this landing was away from the centre of the town, which was, in its turn, separated from the River by many acres of meadowland adjoining shallow water on a shafting reach of the same; while at Hartford the terrace back of

the bluff was the site of the business centre of the city. In this way the advantages of location and topography co-operated in securing for Hartford a commanding position in the Valley, and the foresight of her people further improved upon them by the construction of a bridge across the River, which attracted to the city the through traffic from the east and west. Having thus become the junction of the overland route and water transportation, Hartford's opportunities for controlling the surrounding country were practically unlimited; they were so great that even the efforts of a clique of

FIG. XIII.—THE BLUFF AT HARTFORD, CONN.

citizens who, for social reasons, tried to keep the city within the size of a quiet country town, could not prevent it from becoming one of the most thriving factory and commercial cities of New England.

In proportion as the advantages of easy communication in all directions were felt in this part of the valley, New Haven began to realize more and more keenly the disadvantages of her seclusion from the hinterland, and began to consider ways and means how to overcome them. The opening up of the riverless valley to the north seemed the most urgent problem, and, with the example of the

stimulating influence of the Erie Canal on the growth of New York before their eyes, the merchants of New Haven found the solution of the problem in the reconstruction of the waterway of which the irresponsibility of glacial action had deprived their town. A canal was built from New Haven to Northampton, but it did not fulfill the expectations which had caused its construction. Not only did the elements conspire against it in that loose glacial soil, so that it was a source of annoyance and expense rather than of profit for the town, but the times of the predominant importance of waterways were already waning in this part of the country, and not before the canal was succeeded by a railroad did New Haven derive any benefit worth mentioning from the new line of traffic. Nor was it an unmitigated blessing for the towns in the Farmington Valley which it connected. To be sure, it furnished them with both water-power for industries and a line of transportation for the products of the same; but following, as a canal must, the line of lowest depression along the valley, it upset all the geographical values of that part of the country. The location in the meadow now became the only one with a future; a migration of the population from the hillside to the meadows was the consequence of this readjustment of values. Industrial villages dependent on the railroad sprang up along it almost overnight, and the historic settlements on the meadow hill were left out in the cold. Thus old Farmington, whose commerce once competed with that of Hartford, was reduced to the rank of a suburban summering place of that city, while the young settlement of Plainville grew up in the meadow at its expense. Plantsville in Southington, Weatogue and Tariffville in Simsbury, Forestville in Bristol, Augerville and Centerville in Hamden, likewise outstripped the original settlements. When the railroad replaced the canal it only accelerated the process; for it killed highway travel, which had until then been the last standby of the old towns, and it created new competitors at their outskirts by sending out branch lines toward the upland, where, along the fall line, water-power, independent of any canal, caused the rise of other prospering factory villages (Collinsville, Unionville). To towns deprived of such natural advantages, which had no industries but only farming to fall back upon, the railroad proved a Grecian gift indeed, because it carried business past them rather than to them. Avon, for instance, which had been incorporated from Farmington as a separate town during the canal boom, and was, at that time, located at the crossing of the canal and the Albany turnpike with three flourishing hotels and every promise of becoming an important centre of traffic, is to-day nothing

but a sleepy farming community—a more pronounced, but less poetic, repetition of the fate of Farmington.

Similar changes have taken place along the main line, of course.

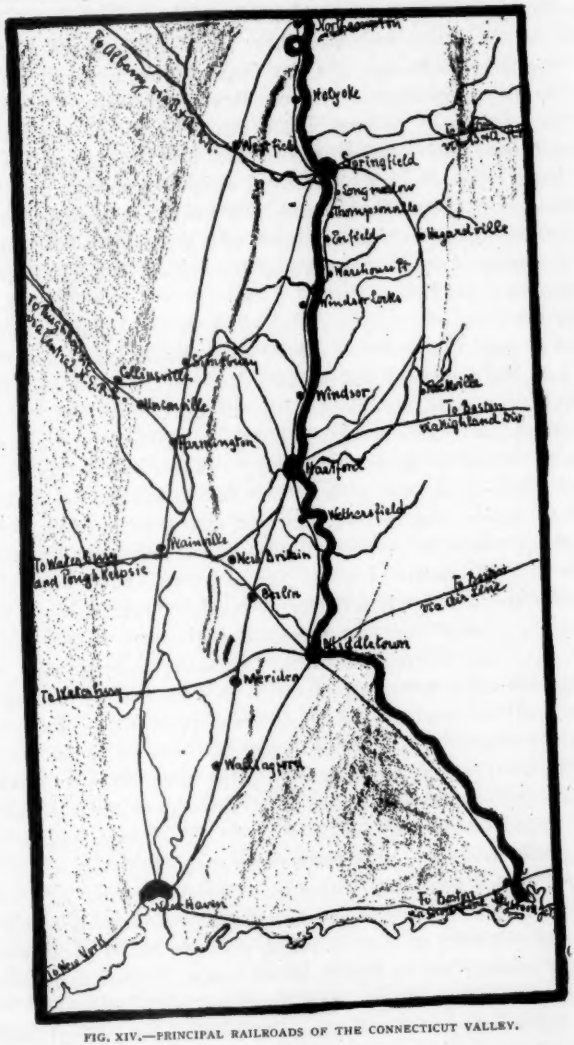

FIG. XIV.—PRINCIPAL RAILROADS OF THE CONNECTICUT VALLEY.

A glance at the map of Connecticut shows that the present importance of a town depends mostly, if not exclusively, on its position with

regard to the principal railroad (Fig. XIV). No railroad, no business; no business, no growth. The three largest cities have developed where the New Haven-Springfield trunk line connects with the lines from the Hudson to the Bay: New Haven, between Boston and New York, has the Shore and Air Lines; Hartford, between Boston and the Poughkeepsie Bridge, has the Central New England and Highland Divisions; Springfield, between Boston and Albany, has the railroad of that name. Where lines of secondary importance intersect the main line, towns and cities of lesser size, though still considerably larger than their less-favoured neighbours, have sprung into prominence: Meriden, Berlin, and New Britain at and near the junctions of the Waterbury-Middletown and Waterbury-Hartford lines with the trunk line, Middletown at that of the Waterbury, Valley Division, and Air Lines.

The consequences of the adjustment to the changed conditions have, however, been, on the whole, less revolutionary here than on the Canal Road, because the railroad does not naturally seek the line of lowest depression, but, like the highway, prefers a little higher and drier ground as long as it can proceed there without too much change of grade. Here, therefore, where no previous canal works had to be utilized in its layout, the distance between it and the original settlements was not so large as to practically deprive them of its blessings, the difficulty could be overcome by a gradual adjustment to the new conditions. The towns in the New Haven Valley simply grew downhill from their original centres to reach the railroad; and though this process caused some disturbance in real-estate values, it did not do the towns any permanent harm. Thus the traveller sees, at the Wallingford depot, a straight street of modern houses leading from the unsightly environment of his stopping-place to the hill about a mile away, where the stately old houses of the town proper welcome him. Meriden has, in a similar way, come down from its sandstone ledge and established a new business centre near the railroad in a quarter which, under the old name of Dogs' Misery, had formerly been considered entirely unfit for human beings to live in. At Hartford, the State capitol has migrated from the terrace overlooking the River to a hill overlooking the railroad—a location which was considered suburban in the old times, and the business centre likewise now extends railroadward, so to speak, instead of riverward, from the centre of the city.

The towns between Hartford and the Falls have needed the least adjustment, because the railroad, which reaches the River at Hartford, proceeds thence on the first terrace, in order to keep out of

danger from the freshets. Consequently, it runs here close by the old settlements, and its only effect has been the change in the character of the parts of the towns through which it passes. The old homes of the aristocrats of the towns on this terrace have sadly deteriorated under the influence of the inhabitants which the new mode of transportation has brought to them. On the eastern bank of the River, however, where the original town centres were built on the second terrace, the case of Farmington is repeated, the depot being so far away from the town proper that young settlements have grown up around it which have every promise of soon outstripping the mother settlement, if they have not already done so: in South Windsor, the place where the old warehouse stood is, under the name of Warehouse Point, fast being transformed into a lively village; in Enfield, Thompsonville is a hustling industrial centre, and in Longmeadow, which has not yet developed a railroad colony, the depot stands, as in Farmington, at such distance from human habitations that a stranger, upon arriving there, may for the first few moments believe himself mystified by the conductor.

Hand in hand with this influence of the railroad one of a different nature worked toward the reconstruction of geographical values—namely, the decline of the agricultural industries of the East in proportion as the resources of the West developed. The soil of the Valley could no longer support the increasing population; they had to fall back on other means of subsistence. In most cases, manufacturing was the only one available, and this brought into prominence a location which had never been a favoured one before—that of the fall line on the borders of the former "wilderness." The process has already been touched upon in speaking of the after-canal-boom period in the western valley, in the cases of Collinsville and Unionville, to which later Bristol was added. It is even more pronounced on the east side. The city of Rockville, in the town of Vernon, is perhaps the most striking example. Others are the villages of Talcottville, in the same town; Somerville, in Somers; Hazardville, in Enfield; South Manchester, in Manchester; South Glastonbury, in Glastonbury. Secondary railroads provide for the transportation of their products to the two nearest commercial centres—Hartford and Springfield. The only places which have been able to hold their own without giving up their rural character are the fortunate towns on the alluvial soil of what was once the "meadow," which are as prosperous on the culture of tobacco as the others are on the output of their mills.

The latest stage in this modernisation of the geographical aspects

of the Valley is just beginning; under the influence of the improved methods of communication and of the increasing community of interests caused by the uniformity of business in the neighbouring towns, the town boundaries as established during the process of segregation of the last century are rapidly becoming too narrow. One large community has, in the present, ever so much better chances of success than a couple of small ones; and it seems as if in the course of the coming century a process of reconsolidation of the present towns to more or less the size of the original ones, or an absorption of the lesser ones by the large centres, would be the most important geographical event. The possibility of a union of Hartford with West and East Hartford has already been repeatedly discussed—it is certainly not a purely theoretical discussion, and others will probably follow. The tendency is toward the creation of a few large centres between which the remnants of the old times, which have little or no manufacturing opportunities, will be left over for the lovers and seekers of rest from the busy centres, such as Wethersfield, Farmington, Newington, etc.

In the locations of the centres both old and new conditions will combine. The towns of the Farmington Valley will probably never occupy a leading position, because no one of them is geographically so much better endowed than her neighbours as to justify her lording it over them. Moreover, that valley is too narrow to afford space for any one of them to grow or consolidate to a considerable size, and, finally, their connections with the world markets are only of secondary importance. In the New Haven Valley, on the contrary, the advantages of New Haven are still so overwhelming that she will most likely always remain the one mistress of that region, as she has been in the past. Of the Valley Towns proper the glory of Windsor and Wethersfield is a thing of the past, and is reasonably certain to remain so; for as way stations only, not crossings, of the lines of traffic, they will always be at disadvantage with the other three. Windsor is a little better off than Wethersfield, because it is traversed at least by the trunk line, which is quite a compensation for the loss of the navigation business, and renders possible the existence of a few industries which contribute to the prosperity of the town. Wethersfield has, indeed, the water route at her disposal to this day; but this route has ceased to be what it was in the old times, as is best shown by the fact that it has been duplicated by a railroad. But this railroad has not given the town larger possibilities, touching no place at which the steamers do not call also; and for more than local purposes is almost of less value than the latter, which at least

reach New York directly, while the railroad, ceasing at the coast where there is no harbour, leads practically nowhere. In spite of its glorious past, Wethersfield is therefore becoming more and more a residential suburb and market garden for the sister city to the north.

Among the three centres which control crossings of the roads, Middletown occupies a position by herself. In spite of being a junction, she will never reap the full benefit of this location before a better development of her hinterland has transformed her peripheral location into a more central one, which is certainly not a matter of the near future. To be sure, the upland is no longer an unsettled wilderness; but in comparison with the business done in the Valley it is perfectly stagnant, and Middletown is actually located at the outskirts of the business world.

This leaves Springfield, Hartford, and New Haven as the close competitors for supremacy in the future. At present New Haven still leads; but it is the question whether this will always be so. The effects of peripheral and central location cannot fail to appear in the future development of these three, as they have among others. The advantage of being a seaport, which has been the basis of New Haven's local importance, is rapidly declining, now that the control of larger territories is involved. If we draw a circle of so many miles diameter around, say, Hartford or Springfield to designate the respective spheres of influence of these towns, and then another of the same size with New Haven as the centre, half of the latter circle will be water. In this age of world-wide commercial relations a seaport can have a more than local importance only if the water half of this circle covers a whole ocean, to which a land half of continental size corresponds, as in the case of our great Atlantic and Pacific ports. If even these ports begin to feel the competition of the large inland centres, of which the rivalry between New York and Chicago is the most striking, but by far not the only, example, what are the prospects of small ports like New Haven, on an inland sea, and with but a limited hinterland? The days of their exclusive maritime character and glory are over, and, like the rural towns, they must fall back on other resources to supplement the losses incurred by the decline of the importance of their shipping interests. New Haven has already done so, and is, indeed, to-day quite as much a manufacturing city as a seaport. But this change of conditions has altered her relative position to the other towns. It is no longer a case of competition between the quiet farming communities and the hustling seaport, but of manufacturing city versus manufacturing

city—that is, a race among equals, in which the best equipped will win, and New Haven's coastal location, once the foundation of its greatness, may very likely become its stumbling-block now.

Springfield and Hartford have the same overland connections as New Haven, and each of them is located, not at the periphery, but right in the heart of one of the most prosperous regions of New England, whose business it attracts and controls by innumerable secondary lines of traffic, steam and electric, which, like the arms of a huge octopus, bring to the centre anything which comes within its reach. In addition to these advantages, which both cities on the River have in common, Hartford has the unique advantage of a location at the now permanent head of navigation, at the transfer point of all merchandise from the water route to land transportation. Under such circumstances, the present outlook is strongly in favour of a final supremacy of this city. Already she has secured the distinction of being the only capital of the State, to the detriment of New Haven. It will be interesting to watch whether further development will justify these expectations, or whether new and unexpected conditions will turn up and once more transform all the geographical values, as has so often been the case in the past.

THE UNCHARTED SIERRA OF SAN PEDRO MÁRTIR.

BY

ARTHUR WALBRIDGE NORTH.

Geographically, there are four subdivisions of Baja California: the Cape Region, embracing the Cape San Lucas territory, and extending northward slightly above the latitude of La Paz, say 24° 20′ north; Central Baja California, extending northward from latitude 24° 20′ north to the 28th parallel; the "Waist," that narrow, rugged region from the 28th to the 30th parallel of north latitude, and *La Frontera*, including the territory from the old Mission sites of Rosario and San Fernando, along the line of the 30th parallel, thence northward to the American boundary above the 32d parallel.

Of La Frontera (The Frontier) the most prominent physical feature is the lofty plateau region of San Pedro Mártir, where the mighty backbone of the Baja California Cordillera attains to its greatest height. Doubtless some of the admirals of the brilliant Conquistador, Cortés, in their voyages up the Gulf of California in

search of a Northwest Passage, were the first civilized men to behold the mighty mountain bulk, and Cabrillo, sailing northward along the Pacific coast, perhaps studied its white outlines. In the year 1702, Padre Kino, the wonderful Jesuit traveller, made note in his journal of seeing the sierra, and sixty-three years later Padre Link, a Bohemian Jesuit from San Borja Mission, came within a few leagues of its southern spurs. If I have read correctly the old chronicles I found at San Borja, he was only saved from death at the hands of a vast multitude of mountain Indians by the intervention of a woman, who, although she was with the savages, was decently clothed and superior to them in bearing and knowledge. Good Padre Junípero Serra, after founding his Lower California Mission of San Fernando, travelled around the southern and western spurs of the sierra on his journey northward to San Diego and the field of his historic mission work in Upper California. Later Padre Gayetano Pallas established the Dominican Mission of San Pedro Mártir de Verona on the southwestern crest of the sierra, and twelve leagues east of the Mission of Santo Domingo. Two years thereafter, in 1796, Lieutenant-Governor Arrigilla made an official visit to the new Mission, only to find that the neophytes had fled in a body and were unwilling to return until a new Padre was conceded to them.

It would appear from the Taylor Summary hereinafter mentioned that James O. Pattie, the first American to visit the interior of the California Peninsula, referred to this great sierra in his journal; but it is more probable that the snow mountains seen by him while on the desert west of the Colorado River were the peaks north and east of Santa Catarina Mission, though he undoubtedly saw San Pedro Mártir Sierra while *en route* to and at his "San Sebastian Mission" (unquestionably San Vicente Mission).

In the days of Maximilian's overthrow and at the instance of a Lower California Colonization Company in which John A. Logan, Benj. F. Butler, August Belmont, Wm. G. Fargo, Caleb Cushing, Leonard W. Jerome, Ben Holladay, John A. Garland and other well-known war-time men were interested, the late J. Ross Browne published a concise little treatise on Lower California, and into the volume he tucked a most excellent "Historical Summary of Lower California History," written by the early California historian, Alexander S. Taylor. In this summary appears the following:

As the vicinities of the bay of Viscaino are reached, and after passing the parallel of 28, the mountain system begins to rapidly rise from 4,000 feet to the elevation of perpetual snow which it appears to attain opposite the Mission of San Fernando, which from several accounts it seems to carry until near the Mission of Santa Catarina. These snowy peaks (for it is only on the highest peaks

snow is seen) must be over 12,000 feet high, as they are reported to be covered with snow in the spring and early summer, by Kino in 1702, Link in 1765, and by Pattie in 1827; but these nevadas have never been laid down geographically correct in the two or three old maps of the Jesuits; indeed they have never been laid down on any we have seen dated after 1830. In their vicinities is stated to be a large mountain lake which feeds the various small streams north of Viscaino Bay.

It is the melting of these snows on this range which makes the northern part of the peninsula so much better watered and more fertile than the southern districts, or even better than our sections between San Diego and San Bernardino.

The following account of the sierra, giving it for the first time an unwonted name, appeared in the "West Coast of Mexico," prepared by the Hydrographic Office of the U. S. Navy from data furnished during the '70's by Commander George Dewey and the officers of the U. S. S. "Narragansett." This book was published in 1880, and in the subsequent reprints the same error was perpetuated:

Calamahue Mountain, sometimes called Santa Catalina Mountain, from the Mission of that name near its foot, lies 28½ miles S. 84 W. (W. by S. ¾ S. mag.), from Point San Felipe. It has a whitish appearance with a jagged top, and is the highest mountain in Lower California, having an elevation of 10,126 feet above the sea level, and can be seen in clear weather a distance of over 100 miles. Strange as it may appear it was never laid down on any chart until those of the Narragansett's survey, 1873 to 1875, were published. Father Kino speaks of it, in 1702, as being covered with snow during the winter and spring.

There is said to be in the vicinity of Mount Calamahue a large mountain lake, which feeds the various small streams that flow toward the Pacific coast.

The Cocopa Indians, who inhabit some parts of this region, report the existence of gold there and they occasionally come to the Colorado River bringing nuggets of pure gold with them, which they trade off. They do not permit white men to enter that part of the country which they inhabit, and thus far have succeeded in keeping undisputed possession of their treasure.

The coast from Point San Felipe to the mouth of the Colorado River, a distance of about thirty miles, trends nearly due north.

In 1894, Mr. George Gould hunted mountain sheep along the northern slopes of the great sierra, and his experiences are recorded in a publication of the Boone and Crockett Club, brought forth in the '90's by Mr. (now President) Theodore Roosevelt. Eight years later Mr. Edmund Heller, of the Field Columbian Museum of Chicago, collected mammals along the western half of San Pedro Mártir, and a report of his doings is on file in the museum's archives.

Late in 1906 I had the pleasure of meeting Dr. Plutarco Ornelas, the talented Consul of the Mexican Government at San Francisco. In response to my inquiries concerning the loftiest sierra in Baja California, he showed me "the latest and most far-reaching" treatise on Mexico, a French work, and under the title of "Calamahue" Mountain we found the identical information furnished by the U. S. Hydrographic Office's publication, and nothing that was more "far-reaching."

I have now submitted practically all the recorded history of the great sierra.

To my numerous queries made throughout Baja California con-

cerning the mountain's name, San Pedro Mártir Sierra has been the unfailing response. Not but that one can find the name "Calamahue" on the California Peninsula, or at least an Indian name so pronounced, but it cannot by any stretch of fancy be attached to the sierra. One hundred miles—after travelling across the deserts and over the barren mountains, and enduring the heat, snakes, and cacti, one is disposed to call it a thousand miles—south of San Pedro Mártir there is a wide and bleak arroyo which the Indians long ago called "Calagnujuet," on the edge of which the Society of Jesus in 1765 established the ill-fated Mission named by them for the arroyo, though they spelt it quite frequently Calamyget. This arroyo flows into the Gulf of California, and at its mouth resides my mining friend, Señor Dick; his adjacent mining camp he calls "Calamajuet" (pronounced Calamawhey). Whether one crosses the San Felipe Desert, the Arroyo Grande Mountains, and the Jacel —or El Tule—country, or travels by the old camino from San Felipe across Valle Trinidad and past Rancho Viejo, Santa Catalina Mission is fifty miles or more north of the sierra; hardly a location "near the foot" of the mountain!

So much concerning the application of the name "Calamahue" to the highest mountain in Baja California, and when the testimony supporting the title "San Pedro Mártir Sierra" is all in, the name "Calamahue" may be dismissed from further consideration. Survivors of the once numerous tribes of the Pais, Cahuilla, Santa Catarina, Yuma and Cocopa Indians, who from time immemorial have visited the mountain in war, or for game, piñones, or gold, say that San Pedro Mártir has been the sierra's title for a long, long time, and that they have never known the name of Calamahue or Santa Catalina to be connected with it; and in this the Mexican and foreign residents concur. Moreover, the Dominican friars established the Mission of San Pedro Mártir de Verona upon the crest of the sierra in the year 1794, and this was full three years before they founded the more northerly Mission of Santa Catarina or Catalina. Unquestionably the sierra derived its name from this Mission of San Pedro Mártir.

With this introductory account of the recorded history and name of the mountain its description may now be undertaken.

Approximating from the coast-line charting of the little-known territory, the geographical bounds of San Pedro Mártin Sierra are as follows, viz.: at the north, 31° 5′ latitude, north, and 115° 40′ and 115° 5′ longitude, west; at the south, 30° 25′ latitude, north, and 115° longitude west. As this sierra has, like the main range through-

out the Peninsula, many sea shells scattered about its surface, doubtless it began life under the ocean and then became an island and looked across a stretch of water far northward to other islands that are now Mt. Whitney, Mt. San Jacinto, and Mt. San Bernardino. The trend of the California Peninsula is southeast and northwest, and so, also, is the trend of its greatest sierra. To the west rugged spurs reach out in long sweeps, in places to the Pacific Ocean over fifty miles distant; to the east granite ridges and sheer precipices drop down to the San Felipe Desert; to the north the main ridge lessens in height until it sinks into a valley known as Valle Trinidad; then gradually rising again it attains at Laguna, over twenty leagues northward, an altitude of near six thousand feet; to the south, also, the range breaks, merging into the hills, and rising later on in the vicinities of the Sierras of Matomi and San Juan de Dios.

The main crest of the Sierra of San Pedro Mártir is approximately fifteen leagues in length by three and a half in breadth. This lofty area is occupied by grassy meadows, timber-covered swales, cross ridges, and *picachos*. There are perennial springs, cold streams, and at the meadow of La Grulla (The Crane) a small laguna or lake; but the sierra is not snowclad save in winter and early spring, and its streams are fed far more by the summer thunderstorms than by melting snow.

The Mission of San Pedro Mártir de Verona was erected on rising ground at the northern edge of a well-watered meadow; now its walls are nearly level with the ground. The buildings were of adobe, built round the usual pátio or court; they faced slightly east of south and covered a space of eighty-five paces by fifty-seven; at the north end and at the south there were entrances. Judging from the ruins there were two small forts near the southwest corner of the Mission, and adjoining the walls at the north was a stock enclosure with an area of eighty-five by twenty-nine paces. There was also a defensive wall of some sort extending southeasterly from the northeast corner of the Mission. Usually the Lower California Missions were roofed with cement and gravel, or with thatch; but having found pieces of old tiling about the ruins of San Pedro Mártir Mission, I can but assume that tile roofs were there in use.

In prehistoric times a race of people came upon the great sierra and on cliffs in its deep cañons drew petroglyphs, with human figures, trees, and strange designs in outline where men of modern stature may not reach. This race had disappeared when red men came upon San Pedro Mártir Sierra; but these later arrivals, also, were men of magnificent physique, for six feet is an ordinary height

among the Cahuillas, the descendants of these old-time Indians. These Cahuillas are large, powerful, dark-skinned natives, and live in the rancherias of Arroyo, Leon, Juanook, and San Antonio, small clusters of thatch and pole shacks situated upon the northern slope of the sierra within easy journeying of the nut-bearing piñon trees; *mestizos*, or mixed bloods, are found at many of the Mexican ranches north and west of the sierra. The old Jesuit traveller Link jotted down in his journal that the Indians on the southern slopes of the mighty sierra that blocked his northern advance lived in houses of wood; but "houses" may have been used relatively, and signified but a shack.

The tradition is that three-quarters of a century ago the Mission of San Pedro Mártir suffered so frequently at the hand of the Cahuillas that soldiers and armed Indian converts from the Missions of San Vicente and Santo Domingo were sent to subdue the troublesome ones. As the Indians all delighted in warfare, and as each tribe considered all others its enemies, one may imagine the holy joy with which the Indian "converts" entered upon the pursuit of the "*broncos.*" Before the dread firearms the latter eventually capitulated, and, bound hand and foot, they were carried away from the mountain crest, tied behind their mounted conquerors; later, the captives were put to work at Santo Tomas (not to be confounded with the mountain meadow of that name), San Vicente, and Santo Domingo Missions. At this time brief visits to the crest of San Pedro Mártir Sierra in search of piñons or venison is the extent of any Cahuilla's interest in the old haunts of his tribe.

In the days of the Frailes, as the Dominican Friars were termed by the Indians, Mission and mountain crest were reached by four different caminos or trails. Down the Peninsula there were three main *Caminos Reales*—the Camino del Golfo, the Camino de la Sierra, and the Camino del Pacífico; and of these trails—they did not attain to the dignity of roads—that of the Sierra passed directly through the Mission grounds, coming in from *Agua Dulce* (Sweet Water), the Mission San Fernando, and the Ranchos of San Juan de Dios and Rosarito at the south, and continuing along the sierra crest and down its northern slope, whence it crossed Valle Trinidad and made straight for Santa Catarina Mission. A branch trail from the Gulf Camino crossed a dozen leagues of arid hills and desert swale from the Bay of San Felipe to the mouth of the Arroyo Santa Rosa, thence by an ascent, rapidly increasing in dizziness, bore upward to the crest, and thence wore along

nearly due west to the Mission. A third trail—and an excellent one—approached the Mission from the west, heading at Santo Domingo Mission, down on the Pacific Camino, and twelve leagues west of San Pedro Mártir Mission.

By this last trail, in July, 1906, I ascended the sierra for the first time, though I was already familiar with many of its spurs. A Mexican, who had already proved his ability as a packer, was my sole companion. From the Mission ruins—in recent years even the ghostly walls were put through the gold pans of treasure-hunters vainly searching for traditional buried wealth of the Frailes—we crossed and criss-crossed the crest of the mountain, following old trails, which invariably wore out and left us to the guidance of my compass, and even the magnetic needle was put out of commission by a fall which I had.

This method of travelling made me most familiar with the sierra, but it ultimately wore upon the nerves of my Mexican. I had taken him expressly because he was a good packer, and because he had never been on San Pedro Mártir Sierra. To my mind, when one really wishes to explore any section of country, guides are an abomination; they will lead one where they have been before, and when any other route is suggested they will cook up the most alarming stories in opposition. Unfortunately for his peace of mind, in the evening of the fifth day of our (to me) delightful wanderings on the crest we made camp in a particularly eerie gorge, and my mozo became alarmed.

"Señor, where are we?" he asked, in some trepidation.

"On top of San Pedro Mártir Sierra," I replied, calmly. This was self-evident, however, and not satisfying.

"But, Señor, do you not fear?"

"What is there to fear?" I answered, amused. "We have two deer for fresh meat, nigh a hundred kilos of provisions; we have ammunition, warm blankets, and the streams are not dry. No, there is no chance of starving or suffering from thirst. This travelling suits me; moreover, I have two books yet unread. Your wages are satisfactory, are they not?"

"Yes, Señor. But we are alone, and we have never before been at this spot."

He would not have understood had I told him that because of this very fact our camp was doubly interesting. I therefore merely asked, "Do you fear death? Do you not know that until our time comes nothing can bring us fatal injury, and when that time comes there will be no escape?"

This fatalistic view that must early come to every big-game hunter quieted the Mexican but a moment; then a lion screeched in an unearthly manner in the crags above, and with most commendable forethought my man made answer to me:

"Señor, that may be well for you," he said; "you are a single man; but I have a wife and children to consider."

Truly, the proper mountain companion is hard to find, and truly also there is an uncalled-for dread by the Mexicans of the portions of San Pedro Mártir Sierra unknown to them.

Two days later my Mexican and I descended the sierra by the Santa Cruz Camino, a steep but plain trail leading westward from La Grulla to Socorro (Help), a gold placer on the western slope; and reinforced by my frontier friend, the "Colonel," we immediately thereafter ascended by the Socorro Camino, returning by the Corona (Crown) and Concepcion Caminos; we then reascended a third time by an unnamed suggestion of a trail, and finally descended into the San Felipe Desert by the ancient and forgotten Santa Rosa Camino. This last camino is one of the two most diabolical caminos in Baja California. The Camino Real from the south and the Agua Caliente Camino at the southeast were so distinct as not to require exploration. No wagon road ascends to the crest of San Pedro Martir Sierra.

Along the western slopes, just above the thirty-five hundred-feet level, there are two old Mexican placers now the property of Americans, and known as Valladares and Socorro. Here the wagon roads connecting with the highway which joins Ensenada with San Quentin terminate. From these placers gold is extracted by the hydraulic process. About Valladares oaks and willows grow, and even a few wild flowers; Socorro, on the other hand, lies in the midst of unchanging dull green *chemise* brush, but the pretty young Mexican-born daughters of the American "miner, '49er," residing at Socorro, are the roses of San Pedro Mártir, and with revolvers strapped to their young waists—for Indians and mestizos are not to be trusted and mountain lions are numerous—these charming Amazons may be seen riding, daily, in perilous places under the shadow of the white sierra, gathering together the half-wild cattle and stock with all the independence of their mother's distant Blue Grass State.

For a league, whether journeying from Socorro or Valladares, the summit-bound traveller rises slowly; then, with a sharp upward pitch, the trail zigzags nerve-rackingly skyward two or three thousand feet, winding in and out of the white granite boulders and

cliffs and leaving behind the mines and the Mexican and Indian ranchos of Santa Cruz, San Antonio, and San Isidro; finally, mountain benches six or seven thousand feet above the sea-level are reached, pines and grass-bound streams appear unexpectedly, the lower world becomes a vista of distant peaks, and the crest of San Pedro Mártir Sierra is attained. The traveller now finds himself in a new world, unlike *in toto* the rest of Baja California, and he may wander at will, for eagle and giant condors, wild ducks, mountain quail, deer, wildcats, lions, coyotes, half-wild horses and cattle, descendants of the herds of the Frailes, alone dwell on the crest of this sierra; for short periods native vaqueros occupy shacks at the meadows of Santo Tomas and La Grulla, but crisp nights and mornings, most invigorating to northern blood, are not relished by the Mexicans.

Throughout Baja California the deer are rapidly disappearing; in one season, recently, professional hunters killed one hundred and thirty, does and fawns included, in a single locality. On San Pedro Mártir Sierra deer will soon be a tradition; and yet, in the open forest glades, they do add wonderfully to the charm of the wilderness. Until the middle of the last century large gray wolves roamed over the great sierra, but now they have passed into memory, the last known one having been killed in 1903. In the early '80's a lone bear took up his temporary abode on the mountain crest and doubtless enjoyed the marshy meadows and decayed logs, but the native hunters, finding his tracks, fled in dismay, and reported that the devil was upon the sierra. Strange though it may seem, bears do not inhabit even the most remote regions of Baja California. The most numerous and best-guarded species of game on San Pedro Mártir Sierra are the big horn or mountain sheep. Protected by the frightful precipices about them and the intense heat below them, these magnificent creatures live almost in undisturbed content among the barren crags along the well-nigh inaccessible eastern and southeastern portions of the sierra.

Beginning at the south and passing northward along the crest, the successive sierra meadows are known as Santa Eulalia, Santa Rosa and Santo Tomas, La Mision or San Pedro Mártir, La Grulla, La Encantada (The Enchanted, so named on account of its hidden position), and Vallecitos (Little Valley). These meadows each contain from one to two thousand acres of verdant plain, and they are connected by indistinct and broken cattle trails which criss-cross the sierra.

Even in the meadows, gray and white granite boulders are scat-

tered broadcast; while to the immediate north of La Encantada loom three massive white granite *picachos*, the Tres Palomas (Three Doves), and farther north a mighty *picacho*, La Providencia, rises high above the clouds, a gathering-place of condors and eagles, the unscaled home of lions and mountain sheep, the jagged summit of all Baja California, its white granite sides glistening, as though swathed in glittering snow, and visible even from the banks of the Colorado River a hundred miles away. La Corona (The Crown), a high timber-capped ridge to the southwest of La Providencia, vies with the latter in height, and, according to the aneroid, attains an altitude slightly in excess of ten thousand feet. A third and almost equally lofty ridge lies to the north of Corona and is unnamed; a small, rock-bound meadow is concealed below its summit, and near this meadow I found the ruins of an old shack with a stone foundation, doubtless the one-time retreat of a gang of horse thieves who lived on the sierra some years ago and operated in Baja California, Sonora, and along the Border.

Pines are a rarity in Baja California, but on the crest of San Pedro Mártir Sierra—which from a distance seems to be a gigantic mass of barren cliffs—spruce, cypress, tamarack, fir, incense cedar, yellow pine and sugar pine, the pitch pine and the pine that bears the piñons, beloved by the Indians, flourish and fearlessly invade the meadows and the granite ridges. About the streams the aspen and the willow, ferns, and wild flowers cluster, forming cool, enticing nooks; and yet the awful chasms which primeval forces gashed into the sides of the sierra, shaping courses for these same streams to seek their way to the Pacific or to lose themselves in the San Felipe Desert, are grim and forbidding, especially on the desert side.

Beginning at the southeast and continuing to the east, these arroyos are known as Agua Caliente, Santa Rosa, Providencia, and Arroyo del Diablo—in its dread majesty well earning this name; Arroyo Copal, Arroyo Esperanza, and Arroyo San Matias, which trend northward; Arroyo Leon, Arroyo Wecks (Lizard), Arroyo San Rafael, and Arroyo San Pedro take more westerly courses; Valladares and San Antonio Arroyos unite, forming Santo Domingo Arroyo, which runs into the Pacific Ocean leagues distant. San Antonio Arroyo is formed by the junction of the water-courses from La Grulla—called, at its headwaters, La Zanca (The Shank)—and from the Mission; it is the one trout stream in Baja California.

In his efforts to dissuade me from descending the east slope of

San Pedro Mártir, my Mexican mozo advised me that fifteen and twenty-five years ago Americans visited the San Felipe Desert and left their bones whitening near the sierra. However, the "Colonel," the unwilling mozo, and I made the descent, and now the "Colonel" and I think the mozo told the truth. With my compliments, the San Felipe Desert is a mighty bad place to visit in August. On the crest of the sierra frost occurs periodically, and snow is customary from December to April; from this temperature in a day we reached the foot of the sierra, where there was no breath of air; at 7 P.M. the thermometer registered 112 degrees, and twelve hours later paused, merely, at 114 degrees on its upward march!

As we crouched in the poor shade of a *palo verde* at 10 A.M., waiting for night to bring a possible temperature for travelling, the "Colonel" remarked, "There's no dyin' 'till your time comes, but ourn may be mighty close."

However, thanks to night-time and thunderstorms, we eventually swung around to the north of the sierra and reached Valle Trinidad.

For all purposes of the traveller, San Pedro Mártir Sierra is No Man's Land. A small portion of it belongs to an English Colonization Company, the remainder is the property of the numerous heirs, known and unknown, of a Mexican General who, according to tradition, marched up the mountain from San Felipe Bay in 1833 and enforced the Secularization Act of Mexico by appropriating unto himself the best of the lands held by the Frailes of San Pedro Mártir Mission. To the lover of the wilderness the sierra is a rare retreat, where he may look down from lofty meadows and pine-clad slopes upon deep abysses, sharp peaks, arid deserts, and strange seas. Here, too, the scientist may rejoice in his field for discovery, the mountain-climber and the hunter find limitless range for wandering, and the romantic adventurer who would seek for the gold and jewel mines of other days—yes, and the Lost Mission of Santa Ysabel—may here revel in fascinating realms of hope.

NOTE.—The map, unfortunately delayed, will appear hereafter.

GEOGRAPHICAL RECORD.

AFRICA.

SLEEPING SICKNESS IN UGANDA.—The Government of Uganda has adopted a scientific plan for the suppression of sleeping sickness. Throughout the country efforts will be made to exterminate the tsetse fly, which is supposed to be the cause of the disease. The natives, to the estimated number of 20,000, are to be removed from the fly-infested district on the shores of Lake Victoria to healthful locations inland. The sick are to be placed in segregation camps, where they will undergo the so-called atoxyl treatment. The landing-stages along the shore of Victoria Nyanza will be freed from the tsetse fly by means of the complete clearance of all vegetation. Fords, ferries, and water-holes will be similarly dealt with. The native chiefs appear to appreciate fully the importance of the matter, and are co-operating loyally with the Government in helping to stamp out the terrible scourge of Central Africa. E. H.

AMERICA.

WATER-RESOURCES INVESTIGATIONS.—During the fiscal year 1907-8 the water-resources branch of the Geological Survey will carry on measurements of the quantity of water in important streams at over 600 gauging stations in forty-two States. In California, Washington, Oregon, and Maine the work will be in co-operation with the States, but many stations will be maintained by the Survey for the Reclamation Service in connection with irrigation projects. Special-ground water investigations will be carried on in the Atlantic and Gulf Coastal Plains.

GEOLOGIC SURVEYS IN NEW JERSEY.—The survey of the geology of the New Jersey highlands is being continued this year by the United States Geological Survey, the work having been assigned to W. S. Bayley. Mr. Bayley expects to finish the field work on the Greenwood Lake and Ramapo quadrangles before the close of the season.

A STUDY OF AMERICAN INDIAN GAMES.—The Twenty-fourth Annual Report of the Bureau of American Ethnology (1902-03), just issued, contains, besides the administrative report, only a single paper, a monographic study of American Indian Games by Mr. Stewart Culin, of the Brooklyn Institute of Arts and Sciences. He began the collection of the data in 1903 in collaboration with the late Mr. F. H. Cushing, whose ill-health, however, prevented him from doing more than to offer advice and suggestions. Under the studies of Mr. Culin the prevalent notion that games of chance are trivial and of little significance as a subject of research gives way to an appreciation of their importance as a part of human culture. He finds that the Indians of both sexes play games of chance persistently and with utter recklessness as to the wagers laid; and yet these games are intimately connected with religious beliefs and practices and have among all tribes a devotional aspect, and in some cases are of divinatory significance. Thus his study of Indian games is not only an exposition of their technology, but also contributes to an appreciation of native modes of thought and of the motives and impulses that underlie the conduct of primitive peoples.

Over 800 small quarto pages, profusely illustrated and well indexed, are given

to this description of the numerous Indian games. The author received important assistance from many workers and several museums, the material was found to be enormous, and the letterpress is illustrated by 1,112 figures.

The volume contains a classified and illustrated list of practically all the American Indian gaming implements in American and European museums, with a more or less exhaustive summary of the entire literature of the subject. The collection is confined to games in which implements are used.

Relative Humidity Charts of the United States.—In 1880 Professor Elias Loomis published the first chart of relative humidity for the United States. On this chart, which was based on observations made during January, 1875, only four humidity lines were drawn, but two important facts were clearly shown: First, the general north and south trend of the lines over the Great Plains; second, that east of the Rocky Mountains there is a belt of territory "where the mean relative humidity is less than one-half," to quote Loomis's statement. Later, charts for January, July, and for the year were published, the latest ones being those in the *Report of the Chief of the Weather Bureau for 1901-02.* We now have the first relative humidity charts for each month, drawn by Kenneth S. Johnson, of Harvard University, and published in the *Report of the South African Association for the Advancement of Science* for 1906, pp. 161-168 (Cape Town, 1907). These charts are based on data for the uniform period of 14 years (1888-1901), published in the *Report of the Chief of the Weather Bureau* for 1901-02, p. 318.

The curves are drawn for differences of 10 per cent. only, for the sake of clearness in presenting the main facts. Furthermore, the length of the records is not sufficient to warrant greater detail. Among the most striking features shown on the charts is the uniform high relative humidity along the coasts, in contrast with which is the extremely low relative humidity in the southwestern interior, especially in Arizona, Nevada, southeastern California, and the adjacent districts. While the high relative humidity on the coasts remains fairly constant throughout the year, the low in the interior basin becomes more marked as summer approaches, thereby increasing the already strong relative humidity gradient between the Pacific coast and the interior.

Another interesting fact is the annual movement of the lines in the northern part of the interior basin. These travel north in summer, reaching the northern limit in June or July, returning south, or perhaps entirely disappearing, in winter.

Among other features worthy of note is the distorting effect of the Great Lakes, where the relative humidity tends to remain at or near 80%, an effect quite similar to that produced by the oceans. Also—a thing which rarely occurs—there is a prevailing north and south trend of the lines over the Great Plains, originally pointed out by Loomis, as above noted, in the vicinity of the 100th meridian, showing that the relative humidity there does not vary with latitude. R. DeC. W.

Cinder Cone National Monument.—The President has issued a proclamation declaring that the area in the Lassen Peak National Forest, California, which embraces Cinder Cone, the Lava Field, Snag Lake, and Lake Bidwell, is reserved from private appropriation and use and set apart as a national monument. It is to be known as the Cinder Cone National Monument.

The proclamation was issued by authority of an act of Congress approved on June 8, 1906, entitled "An Act for the Preservation of American Antiquities." The act authorizes the President, in his discretion, to declare "historic landmarks, historic and prehistoric structures and other objects of historic or scientific inter-

est" on lands owned or controlled by the Government to be national monuments; and to reserve them from private use and to prevent unauthorized persons from settling upon the lands or from appropriating, injuring, or destroying any feature of the national monuments.

The area now set apart as the Cinder Cone National Monument is described in the "Lassen Peak Folio of the Geologic Atlas" (Folio 15). It is situated near the southern terminus of the Cascade Range. Cinder Cone is about ten miles northeast of Lassen Peak. The cone rises about 640 feet above the river plain in which it stands, is dull black in colour, and composed of scoriæ, lapilli, and sand. On the summit of the cone is a well-developed crater with a depth of 240 feet. The lava field which encircles the Cinder Cone on three sides covers an area of about one by two and one-third miles, ends abruptly on all sides, and is in many places over 100 feet in height. Snag Lake was formed by the damming up of the stream that flowed through the plain by the lava field. Lake Bidwell, on the other side of the lava, was once much larger than it is to-day, a part of its area having been covered by the lava field. This district has been reserved as a monument because its features, as above mentioned, "are of great scientific interest, as illustrations of volcanic activity which are of special importance in tracing the history of the volcanic phenomena of that vicinity."

Oases in the Atacama Desert.—Dr. Simon contributes to *Der Tropenpflanzer* (No. 6, 1907) a paper entitled "Oasenkultur in der chilenischen Wüste Atacama," in which he describes some of the oases in the desert where nitrates are the great product. Pica and Matilla are the most important oases. The supply of drinking water for Iquique is piped from Pica, over sixty miles. These oases are fed by underground water coming from the cordilleras on the east. Intensive agriculture is carried on in the oases, and the product, though limited in quantity, is very important to the thousands of men engaged in the nitrate industry, who would be compelled to live chiefly on preserved foods if it were not for the vegetables and fruit received from Pica and Matilla. Pica wine, a heavy sweet wine resembling madeira or port, is widely known throughout Chile. Alfalfa is a large crop, and is cut five times a year, supplying fodder to the cattle and the draft animals in the nitrate service.

A number of the oases also grow species of acacia, which make excellent fuel. This culture is important in a region whose main industry requires large quantities of fuel.

Exploring the Pilcomayo.—The Pilcomayo River, in its lower course, is the boundary between Paraguay and the Argentine Republic. It crosses the extensive plain of the Gran Chaco, which is inhabited by the Chiriguanos, Mataguayos, Tobas, and other Indian tribes. For generations the navigability of the Pilcomayo has been a vexed question, and it was while Crevaux was trying to solve the problem that he was assassinated in 1882 by the Tobas.

In 1905, according to *La Géographie,* Mr. Gunnar Lange, a Norwegian engineer, studied the navigation of the Pilcomayo from its confluence with the Paraguay to the colony Buena Ventura, near 22° S. Lat. He says that the river is not navigable all the year because of the shallowness of its lower part and barriers of vegetation above Junta Fontana. During most of the year, however, it is accessible to boats drawing not more than a meter. It would not be expensive to keep the channel free of logs and vegetation, and dams and locks would provide sufficient water through the shallows.

In the middle region, where the river is no longer navigable but is divided into small shallow streams, a canal of about 2,700 meters would connect with the Dorado, on which boats might reach the upper Pilcomayo. Mr. Lange thinks it would not be very costly to fit the Pilcomayo for navigation for at least 500 kilometers from its confluence with the Paraguay.

Mr. W. Herrmann, who was studying the middle course of the Pilcomayo, last year wrote from the lower river in September (*Zeitsch.* Berlin Geog. Soc., No. 10, 1906) that he had surveyed it between Lat. 24° and 22° S., and this stretch of the river is navigable for small boats. He had been informed that this was the case as far up the river as San Francisco in Bolivia (near Lat. 21° S.), and he expected to examine this matter on his return. He says that the maps of Thouar, Campos, and Fontana are very erroneous.

EXPLORATION OF THE RIO TIETÉ.—The Geographical and Geological Commission of São Paulo, Brazil, has issued another of the beautiful Reports describing the very detailed exploration and survey of the larger rivers of the State. The report, a large folio in form, contains a description of the Rio Tieté, illustrated with many admirable photographs and detailed maps. These reports are among the most noteworthy accounts of recent exploration in America.

EUROPE.

THE NINTH INTERNATIONAL GEOGRAPHICAL CONGRESS.—The Committee on Organization of the Ninth International Geographical Congress, which will be held in Geneva July 27-Aug. 6, 1908, has arranged ten excursions, some of which will occur before the Congress meets and the others immediately after its adjournment. The scientific direction of each has been placed in the hands of a competent leader, who will this summer study the field to be traversed by the excursion in his charge. Eight or ten days will be the extreme limit of these excursions. The programme of excursions will be given in a preliminary circular and, later, in more detail in a pamphlet to be issued in January, 1908, which will contain scientific and bibliographical information relating to the excursions and the cost to the participants.

The excursions will be given to the study of the morphological phenomena of the Alps; superficial deposits in the fore-Alps, and the limestone and crystalline High Alps; economic forestry at high altitudes; structure of the Jura, the plateau, and the Alps, following a transversal profile in the three regions; botanical excursions among the limestone Alps and the mountains around Lake Geneva; the study of glacial morphology, especially the contrasts between the regions which were covered by ancient glaciers and those which were not; for the comparative study of fluvial and glacial erosion; for the study of the structure of the northern part of the crystalline Alps; and for the study of chemical erosion.

The Committee on Organization will receive offers of papers, under the conditions previously prescribed, until Nov. 30, 1907. Copies of the circular of invitation, the preliminary programme, etc., may be obtained by addressing the Committee on Organization of the Ninth International Geographical Congress, Athénée, Geneva, Switzerland. *Le Globe* (No. 2, 1907) has a long report of the recent meeting of the Committee in which these arrangements were made.

IDENTITY OF LEUCAS ISLAND WITH ANCIENT ITHACA.—In 1904, Emperor William II of Germany provided the means for a topographic survey of the island of Leucas in the Ionian Archipelago as a contribution to the study of the question

whether Leucas is identical with the Homeric island of Ithaca, as has been recently maintained by Dörpfeld and other archæologists. It is well known that some students hold the view that Homer drew upon his imagination for his descriptions of Ithaca, the island home of Ulysses; while others have held that the ancient Ithaca was identical with the small modern island of that name.

Under the auspices of the Emperor, a party consisting of Captain Walther von Marées, Prof. Wilhelm Dörpfeld of the Archæological Institute of Athens, and Lieut. Nonne began the survey and study of Leucas in March, 1905. The result is a folio of forty pages accompanying a portfolio of six maps in colours and well produced, the whole published under the title "Karten von Leucas. Beiträge zur Frage Leukas-Ithaka." The text and maps are by Captain Marées. A number of excellent photographs of various parts of the island illustrate the conclusions which the investigators reached.

A study was made of the geology, topography, and meteorology of the island. The investigations show that within the historic period Leucas must always have been an island instead of having been attached to the mainland. Many data were collected showing striking resemblances between parts of the island and its coasts and ancient Ithaca as described in the Odyssey. Captain von Marées says that the present appearance and conditions of Leucas prove that it was the topographic background of the Odyssey, that Leucas is the Homeric Ithaca, and that the author of the poem knew the island well.

The Development of Turin.—The population of this city has quintupled since 1813. It numbered only 45,000 inhabitants in 1706. In 1796 the population was 93,000. The Napoleonic period was detrimental to its prosperity, and the population fell to 65,588 in 1813. Its population in 1905 was 361,317. Turin is one of the most healthful of cities. The average annual death-rate from 1901 to 1905 was only 16.67 per 1,000 inhabitants.

Statistics of the German Empire.—The Statistisches Jahrbuch für das Deutsche Reich for 1907, issued by the Imperial Statistical Office, Berlin, is, as usual, a model of first-class statistical compilation and arrangement. All the information it contains is readily accessible. The twenty-four groups in which the tables are arranged include the statistics of population, agriculture, fisheries, animal industries, manufacturing, communications, internal and external commerce, money, prices, consumption of materials, public schools, prices of labour, labour organization, medicine and hygiene, sport, meteorological data, the protectorates, and an appendix summarizing international statistics, with diagrams showing the sea trade of the leading world-ports.

AUSTRALIA.

Climate and Vegetation in Australia.—The general relations of climate and vegetation in Australia are clearly emphasized in a recent book by Dr. L. Diels, *Die Pflanzenwelt von West-Australien südlich des Wendekreis* (Engelmann, Leipzig, 1906), which forms Part VII of a larger memoir entitled *Die Vegetation der Erde.* In the interior is an extensive plateau; arid, with few rivers. On the east there are high mountains, descending abruptly to the ocean, while on the other coasts the descent is more gradual. In the north, the climate is tropical, with summer (monsoon) rains; in the south it is more temperate, with winter (subtropical) rains. Tropical forests are found in a few restricted areas between the eastern mountains and the sea, especially on the Bellenden Kerr Range, re-

sembling the tropical forests of Africa, South America, and the Malay Peninsula. Here the rainfall is heavy, and occurs throughout the year. In southeastern Victoria and Tasmania there is also forest growth, in the "temperate" climates of those regions, there being many trees here which are not found in the tropical rain-forest. On the uplands of Victoria and also, more extensively, in the extreme southern angle of Western Australia, a third form of forest is found, the "Sclerophyll," or evergreen forest and bush. Most of the continent is subject to droughts, and straggling trees occur in groups, along watercourses or wherever they can find moisture. Eucalypti are found under all conditions, in the lofty forests; in the widely-dispersed "Blue Gum" scrubs on the grass lands, and as lowly scrubby trees in the more arid interior country or on the exposed mountain slopes. The leaves are set edgewise, and the buds are protected by a lid, which falls off as the buds open.

The following scheme of vegetation types shows the characteristic variation, with rainfall, from the tropical rain-forest to the desert:

TYPE OF VEGETATION.	PRINCIPAL TREE.	UNDER SHRUBS.	SURFACE VEGETATION.
Tropical rain-forest.	Mixture of heavy trees.	Numerous shrubs.	No grass.
Temperate rain-forest.	Eucalyptus dominant.	A few shrubs.	Little grass, many ferns.
Sclerophyll forest.	Eucalyptus dominant.	Numerous small shrubs.	No grass.
Savanna forest.	Eucalyptus or acacia in groups.	Few or no shrubs.	Much grass.
Savanna.	A few low trees or shrubs.		Much grass.
Mulga scrub.	A few low trees or shrubs, chiefly acacia.		Little grass.
Brigalow and mallee scrub and sandheaths.	Numerous low trees or shrubs; acacia and eucalyptus abundant.		No grass.
Desert.	Scattered shrubs; acacia and casuarina.		Little grass, chiefly *Triodia*.

R. DEC. W.

OCEANIA.

DR. PÖCH'S TRAVELS IN NEW GUINEA.—Dr. Rudolf Pöch has a paper in the *Zeitschrift* of the Berlin Geographical Society (No. 3, 1907) on his journeys, chiefly for anthropological study, in German, British, and Dutch New Guinea, occupying nearly two years (1904-1906). He travelled around nearly three-fourths of the island, residing for some months at five different places. His longest stay was at Potsdamhafen and its neighbourhood on the north coast of German New Guinea, where he made a study of the Monumbo and also visited the Alepapun, who are hostile to the Monumbo and live two-days' march in the interior. Though the Germans have occupied Potsdamhafen for years, the Alepapun were unknown to them, and Dr. Pöch was in virgin territory when he reached them.

Many similar cases might be mentioned. Dr. Pöch attributes the fact that so much of New Guinea is still unknown to the great difficulties of travel and the unfriendliness of the natives. He found that the words of songs with which the Monumbo accompany their dances are not understood by them. They told him that they derived these songs from the Watam, whom he visited, and found that they, also, did not understand the songs, but the words, they said, came down to them from their fathers. He believes that these words are from a lost language, and have been handed down by tradition.

He spent some time at Merauke, the military post recently established by the

Dutch Government near the southeast corner of Dutch New Guinea. The post owes its origin to a protest from the British Government relating to the greatly-feared head hunters, who cross the border from Dutch territory to kill natives in the British domain. From this part of the Dutch coast nothing can be seen but a flat plain stretching to the horizon. The unfavourable conditions of navigation and the wild character of the natives have discouraged Malay sailors from visiting the coast, and not even the widely-distributed hen of the Malay archipelago is known there. Along the coast are villages of from 80 to 120 huts each, the distance between the villages being not more than a half hour's walk. The Kaja-Kaja, who inhabit them, are head hunters with peculiarities of their own. The use of the pot in cookery is unknown, and all food is roasted at an open fire. The men live together in huts, while the women and children occupy huts by themselves. Before one of the warriors kills an enemy he seeks, if possible, to learn his name, which the conqueror gives to his own son.

POLAR.

THE BRITISH ANTARCTIC EXPEDITION.—Lieutenant Shackleton gives in the *Scottish Geographical Magazine* (July, 1907) more precise details of the plans for his Antarctic expedition than the first announcement contained (BULL. April, 1907, p. 237). He has selected King Edward VII Land, at the eastern end of Ross's Great Ice Barrier, as the base of operations, instead of Victoria Land, at the western end of the barrier. The Newfoundland sealing steamer *Nimrod*, of 250 net tonnage, with capacity for 300 tons of coal in addition to all supplies, has been purchased. She will leave England about the end of July, and magnetic observations will be taken during the trip to New Zealand. Lieut. Shackleton will leave the vessel at Madeira, but will rejoin her at Lyttelton, N. Z., from which port she will sail south about the first week in the new year. The expedition will probably include twenty-eight members, of whom twelve will be the landing-party at King Edward VII Land, which it is hoped to reach by Feb. 1. The *Nimrod* will return to New Zealand, and will be devoted for eight or nine months to a magnetic survey between New Zealand, Australia, and the east coast of Africa.

The exploring party will place on King Edward VII Land a well-planned living hut, twelve Siberian ponies, a team of twelve picked dogs, and a specially-constructed motor car. Before winter closes in it is hoped a line of supply depots will be established at least 150 geographical miles to the south. It is expected that the winter quarters on King Edward VII Land will be in about 77° 30′ S. Lat., or 750 geographical miles from the pole. Throughout the work, scientific investigation will be coupled with exploration, and during the year in the far south the geologist, the biologist, and the magnetician will devote themselves entirely to their special researches within a radius of 100 miles or so from winter quarters.

In the spring, efforts will be made to extend the line of depôts another 100 miles to the south. A party limited to three members will attempt to reach the south pole, using six of the Siberian ponies and the motor car. Great hopes are entertained of the value of the motor car for traction purposes, but its employment is recognized as an experiment. As a final resort, dogs will be used. A second party of three will penetrate to the southeast behind the coast of King Edward VII Land, while three other men will try to follow the coast east in the direction of Alexander Land. So little is known of all this region that these

journeys can hardly fail to prove fruitful. The return of the *Nimrod* to take the explorers home has been fixed for about the end of January, 1909.

COMMANDER PEARY'S EXPEDITION.—The following statement, published in the *New York Herald* of August 12, explains itself:

NEW YORK CITY, August 10, 1907.

Owing to the failure of the contractors for the Roosevelt's new boilers to live up to their agreement, the main expedition of the Peary Arctic Club will be postponed for a year, and the Roosevelt, when the work of repairs is completed, will go north on a flying trip to deposit my proposed coal depôt at Etah, Greenland, returning the last of September.

In this connection it is proper to state that the contract for the construction and installation of the two new boilers for the Roosevelt was made upon the assurance of the contractors that the work should be completed on June 1, and this provision was embodied in the contract.

As a matter of fact, the boilers are only just completed, and the installation has yet to be done. This will require several days and put the departure of the main expedition so late in the season as to be inadvisable.

The question of funds does not and has not entered into this unfortunate situation. The contract for the work was guaranteed, and all payments have been met when due.

ROBERT E. PEARY.

NEW MAPS.

AFRICA.

CONGO FREE STATE.—Map of the Stanleyville-Ponthierville R. R. Scale, 1:584,000, or 9.3 statute miles to an inch. *Le Mouvement Géographique*, No. 9, Brussels, 1907.

A sketch map of the new railroad on the upper Congo by which the rapids between Stanleyville and Ponthierville have been circumvented. There are five stretches of rapids and two falls, and the difference in elevation between the two places is 138 feet. The length of the railroad is 80.6 miles. The position and length of the bridges and their construction, whether of wood or steel, are indicated.

MOROCCO.—Mapa de la Parte Norte de Marruecos. Por la Comisíon del cuerpo de E. M. del Ejército. Scale, 1:500,000, or 7.8 statute miles to an inch. Depósito de la Guerra, Madrid, 1905.

These two sheets show the northwestern part of Morocco from the Atlantic coast to 2° E. Long. and as far south as 34° N. Lat. They depend upon the route surveys of eleven members of the Spanish General Staff, with additional information from the itineraries of other travellers and from the maps of Flotte-Roquevaire and Mouliéras. The large scale and the strongly contrasting red, blue, gray and black colours have assured clear expression to all the information given. The map contains the best delineation yet made of the routes in northwestern Morocco, and in all respects, excepting the rather rough delineation of topographic forms by gray hachuring, it is an important addition to the cartography of Morocco. Its greatest value lies in the new material supplied by the Spanish Commission.

RHODESIA.—North Eastern Rhodesia. Scale, 1:1,000,000, or 15.8 statute miles to an inch. British South Africa Company, London, 1906.

The sheet was compiled from data in the Survey Office and from surveys made

by the Survey Department of North Eastern Rhodesia. It shows administration stations, missions, mines, roads, and telegraphs. The course of many of the rivers can be only approximately indicated, and the contour lines for heights, while showing the distribution of topographic forms, are provisional.

AMERICA.

U. S. Geological Survey Maps.

United States.—Geologic Map of the Marysville Mining District, Montana. Scale, 1:31,250, or 0.5 statute mile to an inch.

This district was for many years one of the noted gold-producing centres of Montana. The geological formations are shown in colours and the surface forms by contours with 50-feet intervals. The map illustrates Professional Paper No. 57 by Joseph Barrel.

U. S. Hydrographic Office Charts.

Pilot Chart of the North Pacific Ocean, August, 1907.

New York.—Map and Profile showing Sources of and Manner of Obtaining an Additional Supply of Water for the City of New York. Scale, 5 statute miles to an inch. Board of Water Supply of the City of New York, 1905.

The map shows both the Croton and the Catskill sources of supply. Existing reservoirs are in light blue, proposed reservoirs in dark blue, lands to be acquired for reservoirs are in pink, and the aqueduct is in red. The area from which the Catskill water supply is to be drawn embraces 858 square miles, while the present supply from the Croton watershed is drawn from an area of 360 square miles. Profiles show the aqueduct from Greene county to Manhattan and the possible future aqueduct from Catskill creek to Ashokan reservoir.

Brazil.—Brazil. Scale, 1:4,752,000, or 75 statute miles to an inch. Prepared in the International Bureau of American Republics, Williams C. Fox, Director, Washington, 1905.

A fairly well produced map, containing a large amount of information. One of its best features is that the head of navigation is shown on many of the smaller rivers. Heights are in meters, and the map is apparently derived chiefly from French sources.

Brazil.—Planta do Rio Tieté. Scale, 1:50,000, or 0.7 statute mile to an inch. Eight sheets. Commissão Geographica e Geologica do Estado de S. Paulo, São Paulo, 1906.

The Tieté River is one of the two largest tributaries which join the Paraná from the State of São Paulo. These excellent map sheets are on a scale so large that all details of the river, its islands, and the number and position of its feeders are clearly given. The sheets include many cross sections showing the forms of the river bed. The map illustrates the report of the Commission on its exploration and survey of the Rio Tieté.

Honduras.—Mapa de la Republica de Honduras. Scale, 4½ leguas to a mile. By Edward P. Mayes. Rand, McNally & Co., Chicago, 1907.

The map is on a large scale, but the product is commonplace. The various departments and districts are shown by the antiquated method of covering them with distinctive colours. The hachuring means simply that mountains are there

or thereabouts. Violence is done to the spelling of some of the Spanish names, as, for example, V. Consequina instead of Coseguina and Utila instead of Utilla. It is hard to distinguish the completed railroads from the common wagon-roads. The natural scale is not given, though it would enable all geographers to translate the scale into terms of their own linear measure. Many of the best maps now made print not only the natural scale but also the scale of kilometers and of English statute miles, as well as the scale used in the country mapped. As this map gives only the scale of leguas, it is conveniently adapted for use only in countries using the legua as the map unit of linear measurement; and the legua has different values in several Latin American countries.

MEXICO.—Central Mexico. Scale, 1:5,000,000, or 78.9 statute miles to an inch. *Scot. Geog. Mag.*, No. 6, Edinburgh, 1907.

Illustrates a paper by Mr. H. M. Cadell on old Mexican volcanoes. The map (produced by Bartholomew) uses five tints and white to show elevations above the sea.

MEXICO.—Geological Map of the Volcano of Jorullo. Scale, 1:30,000, or 0.47 statute mile to an inch. By E. Ordoñez. Topography by A. Villafaña and A. Anguiano. *Scot. Geog. Mag.*, No. 6, Edinburgh, 1907.

Tints are used to show the various lava streams, basalt, dolerite, and other rocks, fumaroles emitting vapour, etc. The volcano is described in Mr. Cadell's paper.

VENEZUELA.—Fragmento del Mapa General de Venezuela. Scale, 1:1,000,000, or 15.8 statute miles to an inch. Plano Militar de Venezuela, Ministry of War and Marine, Carácas, 1907.

VENEZUELA.—Atlas de Venezuela. Scale, 1:250,000, or 3.95 statute miles to an inch. (Carta, No. 12.) Plano Militar de Venezuela, Ministry of War and Marine, Carácas, 1907.

VENEZUELA.—Plano Topográfico. Scale, 1:50,000, or 0.7 statute mile to an inch. (Part No. 15 of Carta No. 12.) Plano Militar de Venezuela, Ministry of War and Marine, Carácas, 1907.

The Codazzi map of Venezuela published in 1840 has for many years been the chief map of that country. Though based upon imperfect surveys, it long filled a useful purpose; but it is not adequate to present needs. In June, 1904, General Castro, at that time provisional President, issued a decree authorizing surveys upon which to base a new map of Venezuela. A Committee was appointed to take charge of the enterprise, which is being carried on as a branch of the work of the Ministry of War and Marine. Three of the map sheets have thus far been published illustrating the three scales on which the map is to be produced. They have been sent to the Society with a *Memoir* issued by the Ministry of War and Marine (Trabajos del Cuerpo de Ingenieros Encargado del levantamiento del Plano Militar de Venezuela). This work describes the scientific bases upon which the survey is being conducted and the maps produced.

The Cajigal Observatory, on the western outskirts of Carácas, is the place of origin of the longitudes of the republic as presented on the new maps. The Observatory is in 69° 16′ 04″ west of Paris.

A part of the general map on a scale of 1:1,000,000 distinguishes the States by colours, gives place-names and marks, and railroads in black, hydrography and river names in blue and mountains in brown.

Sheet 12 is a specimen of a more detailed map on a scale of 1:250,000. It

shows the Caribbean zone from 0° 15′ E. Long. to 1° 30′ W. Long. The area has no political colouring, but topographic aspects are indicated by green for the valleys and lower plains, and brown for the mountains. The depths in Lake Valencia are shown by contour lines with twenty meters interval. This map, also intended for general use, will show the topographic and larger cultural features of the country and the transportation routes.

The large topographic map (Plano Topográfico) is represented here by a sheet embracing the Caribbean zone from 0° 15′ E. Long. to 0° 10′ W. Long. It is a detailed topographic and cultural map showing all the land-forms, the isolated houses, and many heights in meters. Relief is shown by wash colours and contrast of light and shade instead of by the more scientific method of contours. It is therefore greatly to be desired that elevations in the river valleys be given as well as among the mountains and highlands.

A sheet accompanying these maps shows the conspicuous differences between the new sheets and those of the Codazzi map. An enormous number of data on the latter map were several degrees out of the correct position both in latitude and longitude.

Venezuela is to be congratulated on the great improvement in her maps, which the survey now in progress is making possible. While the sheets are deficient in the most exact cartographic devices, the results, as the first sheets show, will be satisfactory and useful.

ASIA.

Asia Minor.—Karte von Kleinasien. In 24 sheets. Scale, 1:400,000, or 6.3 statute miles to an inch. By Dr. Richard Kiepert. Sheets AII Constantinopel, and BII Brussa. Dietrich Reimer (Ernst Vohsen), Berlin, 1907.

This map of Asia Minor is approaching completion. AII Constantinopel shows the Black Sea zone of Asia Minor from the Bosporus to 31 E. Long. Sheet BII Brussa is a continuation on the south of the sheet just mentioned.

China.—Plan von Tsingtau und Tapautau. Scale not given. In "Guide to Tsingtau," Second edition. H. Wessel, Wolfenbüttel, 1905.

A well-drawn plan in colours of the German capital and port of the Protectorate of Kiauchou. The scale is large enough to show clearly the street names, public buildings, hotels, etc.

Palestine.—Die Bahnen Palaestinas. Scale, 1:2,800,000, or 44.19 statute miles to an inch. *Zeitschrift* of the Berlin Geographical Society, No. 4, 1907.

Syria and Arabia.—Die Hedschâ-Bahn. Scale, 1:16,000,000, or 251 statute miles to an inch. *Zeitschrift* of the Berlin Geographical Society, No. 4, 1907.

The above two black-and-white maps illustrate the first part of a study by M. Blanckenhorn on the Pilgrim Railroad. They show railroads in operation and projected and pilgrim caravan routes. The plan for the Pilgrim Railroad between Damascus and Mecca appears to have been changed between Medina and Mecca. From Medina the route will extend southwest to the Red Sea, follow the coast to Jidda, the port of Mecca and thence east to Mecca.

EUROPE.

France.—Densité de Population du Bas-Languedoc. Scale, 1:320,000, or 3.05 statute miles to an inch. By Maximilien Sorre. *Bulletin* of the Languedoc Geographical Society, Montpellier, Vol. 29, No. 3, 1906.

Shows the density of population in seven tints of brown with six symbols for towns according to number of inhabitants. Illustrates a paper by Mr. Sorre.

GERMANY.—Spezialkarte von Ilmenau und Umgegend bis zur Schmücke. Scale, 1:25,000, or 0.39 statute mile to an inch. By Dr. F. Hassenstein. Verlag von Friedrich Fleischer Nachfolger (Aug. Schröter's Verlag). Ilmenau, 1906. (Price, pf. 75.)

Ilmenau has become a popular watering-place. This map is an excellent example of its class. It is intended chiefly for sojourners in Ilmenau during the season. The sheet has an inset of the town on a scale of about one-tenth of a statute mile to an inch, showing the street plan and all public buildings, sanatoriums, etc. The main map shows clearly all paths, roads, and railroads around the town, the forest areas, river valleys coloured green, and many elevations in meters. Gray is used for topography, though no special effort is made to give details of relief. Thus nothing impairs the clearness with which the highways and byways are shown.

GREAT BRITAIN.—Map of Conon and Beauly Basins. Scale, 1:126,720, or 2 statute miles to an inch. *The Scot. Geog. Mag.*, No. 4, Edinburgh, 1907.

The Beauly and the Conon are examples of a complex river system formed of several large streams nearly equal in length and volume and confluent at a comparatively short distance above the river mouth. The map illustrates Mr. L. W. Hinxman's paper on the physical geography of these rivers and is one of the admirable products of the Edinburgh Geographical Institute. It shows heights above sea-level by white and four tints of brown.

ITALY.—Lago di Garda. Scale, 1:200,000, or 3.1 statute miles to an inch. Deutsche Buchhandlung, Bozen, 1907.

A modest map, apparently intended for a guide-book, with much information as to routes and elevations in that part of the Italian lake region where it penetrates the Tyrol.

SWITZERLAND.—Exkursionsgebiet der Montreux-Berner Oberland-Bahn. Scale, 1:75,000, or 1.18 statute miles to an inch. By J. Frey. Kümmerly & Frey et A. Francke, Bern, 1907.

The map, based upon that of the Swiss Topographic Bureau, is one of the superior products for which this map house is noted. The large scale permits the inclusion of an immense amount of information. The mountains are shown with relief effect, but the light and shade used for this purpose do not interfere with the reading of the underlying contour lines. Practically every house outside of the largest towns is shown, and many hundreds of elevations are given. To tourists in this region the map is indispensable.

OCEANIA.

AUSTRALIA.—Map Illustrating the Capture of the Wollondilly River by the Shoalhaven River, New South Wales. Scale, 1 statute mile to an inch. By W. G. Woolnough and T. Griffith Taylor. *Proceedings* of the Linnean Soc. of New South Wales for 1906, Sydney.

Illustrates an account of a striking example of river capture in the coastal district of New South Wales.

DUTCH NEW GUINEA.—Schetskaart der Maccluer-Golf. Scale, 1:500,000, or 7.8 statute miles to an inch. With insets of the Waromge, Kais, Metamani, and

Sebjar rivers on a scale of 1:200,000, or 3.1 statute miles to an inch. By J. W. van Hille. *Tijdschrift* of the Royal Netherlands Geographical Society, Vol. XIV, No. 4, Leyden, 1907.

The map gives important new data, including many soundings in MacCluer Inlet and the largest rivers.

DUTCH EAST INDIES.—Overzichtskaart der Ontworpen Stations voor draadlooze Telegrafie in Nederlandsch-Indië. Scale, 1:12,500,000, or 197.2 statute miles to an inch. *Tijdschrift* of the Royal Netherlands Geographical Society, Vol. XIV, No. 4, Leyden, 1907.

The Dutch Government has given a concession for the erection of 38 wireless telegraph stations in the Dutch East Indies. The stations are distributed at the most important coast points from Sabang at the north end of Sumatra to Saparoea in Ceram. Two or three stations are in the interior of the islands. The cable lines are also indicated.

GENERAL.

WORLD.—Chart of the World showing the distribution of the Lower Graptolite Faunas. (Mercator Projection.) 57th Annual Report New York State Museum, Vol. 4, Appendix 8, Albany, 1905.

Outlines of the present land masses are shown, and upon them are imposed in buff tint the land areas at the beginning of the Champlain (Lower Siluric) era.

WORLD.—Carte Cotonnière. By A. Lalière. *Bull.* de la Soc. Royale de Géog. d'Anvers, Vol. 30, Antwerp, 1906.

Illustrates a monograph by Mr. Lalière on "Cotton" which appears in Vols. 29 and 30 of this publication. The areas of production are distinguished from those in which cotton-growing is as yet experimental. It is practically a reproduction from the cotton map in Bartholomew's "Atlas of Commerce."

ATLASES.

HAMMOND'S ATLAS OF NEW YORK CITY AND THE METROPOLITAN DISTRICT.—Thirteen page and double-page maps. C. S. Hammond & Co., New York (1907?). (Price, $1.)

This is a folio containing maps in colours of each borough of New York City and the suburban regions. Street plans, transportation routes, and the roads in the country around New York are especially conspicuous. Perhaps no other map of the metropolitan district and its environs gives so much information clearly presented in a shape so convenient to handle and carry as this atlas.

BOOK NOTICES.

Quelques Mots sur la politesse chinoise. Par le P. Simon Kiong. S.J. Avec appendices sur les fourrures et soieries par le P. F. Courtois, S.J. Variétés sinologiques, No. 25. Shanghai, Imprimerie de la Mission Catholique, 1906, 120 p.

A Chinese proverb says, "In entering a country, inquire for what is forbidden; in entering a village, inquire what is customary there." This sentence might well stand as a motto for this book. Intended, above all, for practical purposes, to serve the needs of Europeans who have dealings with the Chinese, it initiates the reader into the whole intricate system of Chinese social intercourse, politeness, official costume, and visits, salutations to be made, the reception-room, the use of palanquins and horses—in short, it is a handbook which teaches what constitutes good behaviour and *savoir vivre* in a Chinese gentleman, and thus in it are reflected many sides of Chinese customs and manners. The rules of propriety have always been a science in themselves, to the exposition of which one of the ancient classical books, the "Li ki," is entirely devoted—a science without the knowledge of which no Chinaman can properly live, and indispensable, also, to every foreigner who desires to make for success in China either in business or politics. Many foreigners living or travelling in China have no idea how many hundred times they inadvertently and unconsciously hurt the feelings of the people and ruin their own success by little words, actions, or omissions. A foreign consul, a newcomer, who was just paying his first visit to the Viceroy Chang Chih-tung, in his well-meant efforts to tell him all sorts of agreeable things, finally turned to his interpreter with the remark that he had seen Li Hung-chang on his visit to Europe, ejaculating the name of the old diplomat in a somewhat loud voice, whereupon the zealous interpreter translated his remark literally into Chinese. The Viceroy turned away, completely disgusted, and the whole friendly visit proved a failure. The consul, without knowing it, had violated several fundamental rules of propriety. In the first place, the names of people should not be called out in a loud voice on an official visit; and, secondly, the names of exalted and deceased personages should not be pronounced at all, but only hinted at; at all events, the name of the then living person is now not valid at all, but to be supplanted by its posthumous title. No educated Chinese, except when conversing in English to foreigners, would dare to speak of Li Hung-chang. Such examples could be told by scores, not to mention those which, through the careless infringement of popular customs, may result in most serious consequences. Indeed, it is certainly much more the discriminating tact of the foreigner as regards what should be avoided than the strict observance of Chinese etiquette itself, which is the secret to his success; and in whatever capacity, and with whatever aims, a man may set out for China, he should not fail to familiarize himself with what is tactful and *bon ton* in the thoughts of the Chinese. Such a study will always pay, whereas its neglect will reap the consequences. The present publication is a commendable guide-book to this end; and it would be desirable for every foreign Government to lay in a goodly supply of copies for distribution among those members of its consular and diplomatic staff who are to be sent to China, and who should pass an examination on the subject before their departure. B. L.

The Passing of Korea. By Homer B. Hulbert. Illustrated from Photographs. New York, Doubleday, Page & Company, 1906. xii + 473 pages. ($3.80 net.)

Mr. Hulbert has laid down his many years' personal experiences and studies of Korea and her people in a most attractive and well-written volume. It is the work of a man who has long laboured with and among those people, and who is inspired by a deep and sincere sympathy for them, which readily imparts itself to the reader. Moreover, Mr. Hulbert is the eager defender of the cause of the Koreans, and stands up for their rights and their just claims to being a civilized nation. No doubt, our sympathies will always turn towards a suppressed and downtrodden people; and, indeed, the Koreans are people who, for their personal character and their cultural achievements, are justly entitled to receive our sympathies. But our author, like all passionate advocates of an ideal cause, goes decidedly too far in his pro-Korean inclinations, and is sometimes led to quite incommensurate judgments as to the Japanese and Chinese; especially in regard to the nature and culture of the latter has he no just appreciation, nor is the relation and indebtedness of Korean to Chinese culture very clearly exhibited. His characterization of the Korean people cannot at all withstand criticism, and even a layman could easily detect its many weak points and the doubtfulness of its method. There seems to him to be a greater temperamental difference between the Japanese or Chinese and the Westerner than between the Korean and the Westerner. The Japanese are, according to him, a people of sanguine temperament, quick, versatile, idealistic, and their temperamental sprightliness approaches the verge of volatility. "The Chinese, while very superstitious"—which peoples of the globe are not superstitious?—"is comparatively phlegmatic. The Japanese lean toward the idealistic;" which is by no means correct; "the Chinese toward the utilitarian; and the temperament of the Korean lies midway between the two, in a combination of qualities which make him rationally idealistic." "The most happy combination of rationality and emotionalism," which Hulbert then points out as the chief characteristic trait of the Koreans, is much too vague and general, and something to be found among all peoples. "And, more than this," he continues, "I would submit that it is the same combination that has made the Anglo-Saxon what he is. He is at once cool-headed and hot-headed. He can reason calmly and act at white heat. It is this welding of two different but not contrary characteristics that makes the power of the Anglo-Saxon peoples." "The Korean is much more like ourselves." "The religions of China were forced upon Korea irrespective of her needs or desires." "Confucianism is no religion; it is simply patriarchal law." In this way, Mr. Hulbert argues in watchwords and speculative preconceived constructions which are only partially true, but he does not build logical conclusions on facts objectively evolved and perceived. He is impulsive, not inductive or deductive. The reason why most people look upon the Korean as little better than contemptible is, according to his interpretation, because in the sixth and seventh centuries, when Korea was in her formative stage, when she was just ready to enter upon a career of independent thought and achievement, the ponderous load of Chinese civilization was laid upon her like an incubus. This view is so unhistorical and illogical that it does not require refutation. While now, on the one hand, according to Hulbert, Korea has always been the slave of Chinese thought, and lost all spontaneity and originality, while to imitate became her highest ambition, he states, on the other hand, that Korea is a good illustration of the great influence which environment exerts upon a people's mental and moral characteristics. How these two statements are to be reconciled I am unable to see. Professor Möbius of Leipzig

once remarked quite justly that explanations from the *milieu* are always superficial. Indeed we recognize more and more that the *milieu* is nothing as compared with the overwhelming power of historical agencies. If the Korean is a Chinaman in his thoughts, he is modelled after a foreign culture, and not in accordance with his environment. The most striking blow to this theory of *milieu* influences is the Chinaman himself, who all over the world, wherever he wends his way, remains a Chinaman, and is not a particle affected by a new environment.

The portion of the book dealing with the history of the country is the least satisfactory. The author seems to be entirely unaware of the fact that European scholars, first of all in France, have done splendid research-work on this subject; and that, for example, Maurice Couvant, in his magnificent "Bibliographie coréenne" (in four volumes), has created a monumental work for all times to come. The problem regarding the historical character of Kija, a Chinese, credited with having introduced civilization into Korea about 1122 B. C., has been satisfactorily solved, in my opinion, by Professor Edouard Chavannes in his "Les mémoires historiques de Se-ma Ts'ien" (Vol. II, p. 135; Vol. V, p. 486).

The chapters dealing with the subjects of cultural history—like architecture and building, transportation, industries, games, monuments and relics, literature, music and poetry, art, education, folk-lore, etc.—all contain valuable and interesting material, which, however, is not well arranged. The best feature of the book is the 54 full-page plates, which are excellent throughout, and are of great scientific value in themselves. Of the popular books on Korea in existence Mr. Hulbert's work is doubtless one of the best, and surely the one most pleasantly written and most entertaining; but we cannot suppress a certain feeling of honest regret which creeps into the mind when perusing such books. How infinitely more could the author have accomplished, what invaluable services could he have rendered to science, with his doubtless comprehensive knowledge of the language, and with all the multifarious resources at his disposal, if he had had the advantage of a thorough philological and anthropological training! B. L.

Problems of the Panama Canal. By Brig.-Gen. Henry L. Abbot. (Second Edition.) xii and 269 pp., Diagrams and Illustrations from Photographs and Index. The MacMillan Company, New York, 1907. (Price, $2.)

The first edition of this valuable work was reviewed in the BULLETIN for 1905, p. 441-2. The new edition covers the progress of events since the transfer of the work to the United States, bringing the history and technology of the enterprise down to 1907.

Clays, their Occurrence, Properties and Uses; with especial reference to those of the United States. By Heinrich Ries, Ph.D, New York, John Wiley & Sons, 1906. Pp. xvi, 490. Pll. XLIV, figs. 65.

Nothing, perhaps, indicates more clearly the growth of specialization in geologic science than the appearance of this general treatise upon the subject of clays, a subject that a few years ago seemed to have little interest outside of brick yards and quarries for material for the manufacture of pottery. The present status of the specialty is due in an important degree to the investigations and reports of the author himself, who, beginning with the clays of the Hudson River region, has gradually extended his field of study until he has been called upon to prepare detailed reports upon the clays of many of the clay-producing States of the Union, and he has studied the chief deposits of Europe. Such an extended, practical, first-

hand acquaintance with field and factory data has given Professor Ries a grasp of his subject that is shown throughout the book.

The author first discusses at some length the origin of clay, and presents the following classification, based principally upon origin :

A. Residual clays. (By decomposition of rocks, *in situ*.)
  I. Kaolins or china-clays. (White-burning.)
    (a) Veins derived from pegmatite.
    (b) Blanket deposits, derived from extensive areas of igneous or metamorphic rocks.
    (c) Pockets in limestone, as indianaite.
  II.—Red-burning residuals, derived from different kinds of rocks.

B. Colluvial clays, representing deposits formed by wash from the foregoing and of either refractory or non-refractory character.

C. Transported clays.
  I. Deposited in water.
    (a) Marine clays or shales. Deposits often of great extent.
      White-burning clays. Ball-clays.
      Fire-clays or shales. Buff burning.
      Impure clays or shales. { Calcareous. / Non-calcareous.
    (b) Lacustrine clays. (Deposited in lakes or swamps.)
      Fire-clays or shales.
      Impure clays or shales, red-burning.
      Calcareous clays, usually of surface character.
    (c) Flood-plain clays.
      Usually impure and sandy.
    (d) Estuarine clays. (Deposited in estuaries.)
      Mostly impure and finely laminated.
  II. Glacial clays, found in the drift, and often stony.
    May be either red- or cream- burning.
  III. Wind-formed deposits (some loess).
  IV. Chemical deposits. (Some flint clays.)

The second chapter deals with the chemical properties of clay and contains many valuable analyses. An interesting part of this chapter is devoted to the mineral compounds that are found in clay and their behaviour in the process of treatment or manufacture. The importance of the "rational analysis," which gives the proportionate mineral composition of a clay, is strongly emphasized. Practical suggestions are made as to the proper substances to be put with certain clays to counteract defects or to produce more desirable results, and as to the effects of firing due to the presence or absence of certain proportions of iron oxides, lime and other compounds.

The chapter on the physical properties of clay is very full. It will surprise those not familiar with the subject to learn that about twenty different kinds of clay are used in the arts. These are all described, the more important kinds with fullness and with chemical and physical analyses. The author then discusses the methods of prospecting for clay deposits and of winning the clay when it has been found, and the treatment that the material must undergo to prepare it for the manufacture.

Ninety-six uses of clay are specified as showing some of the applications made of the useful substance. This gives a hint of the variety necessarily obtaining in methods of manufacture, and enables one to appreciate the wide differences in the

requirements that clays must meet. Processes and up-to-date machines are concisely described and are illustrated from photographs.

The remainder of the book (nearly half of the whole) is devoted to a particularly valuable and compendious, though brief, description of the occurrence, properties and uses of the clays found in the different States. Under each State the clays are grouped according to geologic formations, since such an arrangement permits greater uniformity in presentation than does a grouping by kinds. At the end of the discussion of each State there is a selected bibliography pertaining to that State, which enables the interested reader to pursue his studies as far as the literature will carry him.

The book is gotten up in attractive style, with clear type and good paper. The illustrations consist of forty-four half-tone plates, most of which bear two figures, and sixty-five text illustrations, and add much to the value of the book. Greater variety in the type used for headings, particularly in the chapters on distribution, would have aided ready reference to the subject matter.

E. O. H.

Switzerland, the Country and its People. Written by Clarence Rook, Painted by Effie Jardine. 8vo. New York, G. P. Putnam's Sons. London, Chatto & Windus, 1907.

The, mostly colored, illustrations (full-page) are generally good. To some, they may appear too "impressionistic," to others the tints may not seem subdued enough. But they are certainly creditable to the skill and taste of the artist. There is one grave and very regrettable mistake in the title to one of the views, that of the Matterhorn facing page 264. "The Matterhorn, from Grindelwald," must be a surprise to anybody who knows something about location of the two points and their distance from each other. Grindelwald lies on the northwestern base of the Bernese Alps, the Matterhorn rises on the Italian frontier, and a continuous chain of snowy mountains of 10 to 14 thousand feet in elevation rises between them. It is utterly impossible to see the Matterhorn from the northern base of the Bernese Alps, whereas it may be visible from a greater distance, as from some point of the crest of the Jura. We surmise the error, which is caused by an oversight in proof-reading, originated in the resemblance between the words "Matterhorn" and "Wetterhorn"; it is certainly not a mistake of the author's. But it should be corrected in later editions.

If anything is to be criticized in the general tone of the text, it is an excess in praise. Switzerland is undeniably a remarkable country, and its people have secured a position that is politically peculiar, but they are only human beings and have their defects and flaws. These defects Mr. Rook very kindly passes over, to a great extent.

In the United States Switzerland, that is, the Swiss people, and their evolution from four tiny mountain communities six hundred years ago into a reasonably-consolidated Republic, their political and social organization and achievements in intellectual progress are woefully unknown, or rather they are disregarded. It is assumed that nothing can be gained from acquaintance with the development of a people who make no noise in the world. The author of this book, an Englishman, has taken it to heart to show that this an entirely wrong impression, and, while he addresses himself to his countrymen (who are far more advanced in their knowledge of Switzerland than their American cousins), it would not be amiss if his statements were treasured on this side of the Atlantic. Switzerland is not merely an international pleasure-ground; it is a spot where a good deal may be learned of political management, economy, military organization, and especially education. A nation

whose sons and daughters, all without exception, are able to read and write, and the majority even in at least two languages, must enjoy an exceptionally thorough system of public instruction, for other branches are developed in the same proportion. The military budget of Switzerland does not exceed six millions of dollars per annum, and yet, in twenty-four hours' time, this nation of 3,250,000 can put 234,000 men in marching order, fully organized, armed and equipped; yet there is no standing army, and uniforms are rarely seen in the streets. Within a few days that number of fighting men can be increased to more than half a million, with proportionate artillery of the highest order. This presupposes a militia system not equalled in the world. Mr. Rook also says, and very justly: "If the best government is that which veils its activity with most success, if the art of government is to conceal its art, then Switzerland has achieved a triumph. . . . The machinery runs taut and true, and there is never encountered that terrible waste product, that clog to the wheels, the beggar. In Switzerland there may be here and there the extortionist and the unjust. No man demands money without offering a return, even though the return may not be the obvious equivalent. He is under a government he chooses for himself. . . . There is no parade of personal authority, no advertised individual pre-eminence, nor can the ordinary visitor recall the name of any single Swiss statesman who is greasing the wheels that turn so smoothly."

How this state of things was evolved the author attempts to tell in a review of the history of Switzerland. But, for a geographical publication, what he says of the country and its nature is of principal interest, and, furthermore, that country is the stage on which the history was enacted; hence it stands in intimate relation with the events of evolution. Mr. Rook, however, is very sparing—too sparing, we are afraid—of descriptions of nature and geographic information; he appears to rely mostly upon the illustrations for that part of his task; the *people* engross his attention, and there is such a wealth of literature on the geography of Switzerland that we may forgive him for his omission.

His treatment of Swiss history is, to say the least, very fair. Not to be too eulogistic and thus incur the reproach of partiality for the author, we will venture a few observations. He admits the truth of the Tell story, and he is right; but he also admits (what is equally true) that the connection of Tell with the uprising of what were in the thirteenth century, and to a certain extent to-day, called the "Waldstaetten" (literally forest *sites*), is a later addition to the original tale. Tell perished about fifty years previous to the expulsion of the bailiff Landenberg. His killing of Gessler was an act of private vengeance without political bearing. Manifestly erroneous, however, is the statement on page 25 that Aventicum was a "Roman capital of Helvetia" already before the wholesale immigration of the Celtic Swiss into southeastern France in 57 B. C. There were no Roman settlements on Helvetian soil previous to the battle of Bibracte (57), after which the Helvetians returned to Switzerland again, but as a conquered people, subject to the Romans. The destruction of Aventicum (Avenches, Wiflisburg in Swiss German) took place in 69 A. D., and by the Romans under Caecina, in punishment of the Helvetians for their opposition to Vitellius. When Vespasian became Emperor (69) it had just been destroyed. Nor is it correct that Zurich threw in its lot with the Forest Cantons "within a few weeks" after the formation of the original league in 1308. At the Battle of Morgarten, seven years after the uprising, men from Zurich fought on the Austrian side against Schwyz and her allies. At the Battle of Sempach (June 3d, 1386) the Austrian chivalry did not "rush upon" the Swiss. It was the Swiss who attacked, and the Austrian nobles received the onslaught on foot with their long

lances: had the knights charged on horseback, on the open meadow of Sempach, the Swiss might have fared very badly. Mr. Rook omits the important civil war between the inner Cantons and Zurich which culminated in the bloody battle of St. Jacob on the Sihl (1443), and nearly threw Zurich back into the arms of Austria, and had its last frightful echo on the banks of the Birs near Basle in 1444, in the battle of St. Jacob on the Birs, where 1,500 Swiss, with more ferocity than judgment, kept up a reckless attack on a French army of over 30,000 men with artillery, until only a dozen of their number were left alive.

The author's treatment of Swiss history, from the beginning of the sixteenth century on, is excellent. His picture of the sad period of the invasion by France (1798–99) could not be better. And his appreciation of the conduct of Napoleon, the personal episodes woven into the tale of general events, is of great interest. There is an air of actuality in the various scenes of Napoleon's deportment during his re-establishment of the Confederacy on a new basis that lends them a peculiar charm.

We may object to a statement made early in the book—namely, that Switzerland has no aristocracy. It has no more a feudal aristocracy, but the origin of several families still in existence with the prefix "von," or "de," was feudal. And these families, as well as those who up to 1830 were the heads of cantonal oligarchies, cling to their titles without ostentation. They have ceased to enjoy prerogatives of a political character, but they maintain their social traditions in a dignified and by no means offensive manner.

As an Englishman, Mr. Rook naturally dwells with a certain predilection on Geneva and its environs, where so many great men of Britain have left touching and indelible marks. But he exaggerates the importance of Voltaire for the intellectual development of Switzerland. The tendency of the so-called Philosopher of Ferney was mostly disintegrating for everything he dealt with. With the positive character of the Swiss such a negative element did not, and could not, obtain much foothold. Neither did Rousseau exert a powerful influence on the methods of education practically introduced by Pestalozzi. He and Lavater were men of profound religious sentiment, and the *Émile* was no guide to them. They respected Rousseau (as every honest thinker will), but what they did and wrote rested, above all, on the basis of Christian ideas, rather than on philosophic theory. In the review of scientific achievements by Swiss, in former centuries, we miss the great names of Conrad Gessner, Albrecht von Haller, and, also, proper mention of the city of Basle. Already in the sixteenth century Basle was the place where important geographic works, touching, also, upon America, were printed, and two centuries later the great names of Euler and the Bernoulli family attached the fame of Basle permanently to the world of mathematical and physical science. These are points of comparatively minor importance, and by no means impair the general value of the work.

The chapters on sport, chiefly winter sport, in Switzerland are entertaining, and particularly well illustrated. They furnish the author with an occasion to allude to climate and topography, in a manner not often found in analogous literature.

A. F. B.

Nearest the North Pole. A Narrative of the Polar Expedition of the Peary Arctic Club in the S.S. Roosevelt, 1905–1906. By R. E. Peary, U. S. N. xx and 411 pp., 99 Photographs, 2 Maps, a Frontispiece in colour by Albert Operti, and Index. Doubleday, Page & Company, New York, 1907.

Peary's latest book is a most valuable addition to Arctic literature. It is the

record of a splendid achievement, written by a man who is pre-eminent for his genius in polar research, and for his long consecration to it. The illustrations are superb, and the publishers have issued the book with all the care they are giving to their notable series of geographical works.

Peary's recent work, described in this book, is unique, not only because he achieved the nearest approach to the pole, but also for other reasons. It was the first Arctic expedition, five-sevenths of whose personnel were men, women, and children of a barbarous tribe. Of the eight men who, in April, 1906, stood at the most northern point ever reached by human beings, six were Eskimos. They had no idea why Peary took them on that terrible journey over the frozen sea, but they trusted him implicitly, followed where he led, and faithfully did the work he gave them to do. Earlier explorers gave these Smith Sound natives a bad reputation. They were reported to be worthless for sledging, always unreliable, and even treacherous at times. But Peary knew them through and through, and he says, in the tribute he pays them, that the north pole will some day be reached with their help.

Peary's ready resource, when he meets the unexpected that so often happens in the Arctic, pulled him through some unpleasant situations in last year's experience. He had, for example, 200 dogs that were essential to his proposed journey to the pole. But one day he found that the whale meat he had provided for them was spoiled, and he was face to face with the problem of supporting his dogs and most of his Eskimos on the resources of the country. He at once scattered the hunters with their women, children, and the dogs in little groups of snow houses, some of them as far away as Lake Hazen, 150 miles from the ship. The dogs lived on the musk oxen, deer, and hides supplied for them, and sledge-loads of meat were taken to the ship. We never knew before that there were such abounding resources in the game of Grant Land.

The exploring steamer *Roosevelt*, which had been built from Peary's plans, was a great success, and he believes that no other ship ever could have lived through the terrible hours when she was hugged by many square miles of heavy floes that seemed bent on grinding her to pieces. She did not always emerge unscathed, but she accomplished everything for which she was built.

Peary was engaged about five months in the field work he went north to do. In that time he was aboard his ship only eight days. As a test of human endurance the work of those months was wonderful. Few explorers have ever rendered in so short a time so much geographical service. He outstripped all previous efforts to approach the pole, and if it had not been for the wide water-lanes that delayed him for many days he would probably have reached the pole. He made this journey over the sea ice through four degrees of latitude, and then went on a round trip of about 600 miles along the coast of Grant Land. One hundred and fifty miles of that shore-line is his own, and we see it now for the first time on the map in his book. He also saw a new land out in the ocean to the west which he named Crocker Land, and he solved the mystery of the paleocrystic ice discovered by Nares in 1875. He found that the birthplace of these floebergs is a long stretch of the Grant Land coast, where many glaciers come down to the shore and rub along the shallow sea bottom till they break off into bergs, and drift to the eastward.

The book gives the whole story of this remarkable expedition. We see Peary's methods of work, the outcome of his originality and experience. The narrative is interesting throughout, for the writer has his way of telling things, and he puts nervous energy into his written records. The dramatic element is strong in many a situation that confronts him, and it does not evaporate when he tries to put it on paper.

Handbook of American Indians, North of Mexico.—Edited by Frederick Webb Hodge. Part 1, ix and 972 pp., many illustrations, and map. Bureau of American Ethnology, Bulletin 30, Washington, 1907.

An alphabetical arrangement of information; the present volume ends with the title Mythology. The scope of the handbook is comprehensive. It aims to give a brief description of every linguistic stock, confederacy, tribe, sub-tribe, settlement known either to history or to tradition, as well as the origin and derivation of every name treated. The leading students in this field are collaborating in the production of the work which will be a valuable addition to sources of information, as the literature relating to American Indians has thus far given few facts about many tribes or settlements of Indians which are here treated briefly, but with essential detail. The many illustrations from photographs are an excellent feature of this encyclopædic work.

OBITUARY.

Charles Comfort Tiffany.

Dr. Tiffany died at Northeast Harbor, Maine, on the 20th of August.

He was born in Baltimore in 1829, and received his education at Dickinson College, Carlisle, Pa., at the Andover Theological Seminary and in the Universities of Halle, Heidelberg, and Berlin. He was ordained Episcopal minister in 1866; was rector of St. James', Fordham, 1867–1871; assistant on the Green Foundation, Trinity Church, Boston, 1871–1874; rector, Church of the Atonement, New York, 1874–1880; rector of Zion Church, 1880–1890, and Archdeacon of the diocese of New York from 1893 until his health gave way three years ago. Release from the cares of his office and travel by land and by sea—to the Mediterranean and to the Baltic, to the Pacific Coast and to the West Indies—brought about a change for the better, and he was apparently well and strong when he left the city in the early summer of this year for his home in the country.

He was the author of the following works:

On Expression in Church Architecture; Modern Atheism; History of the Protestant Episcopal Church in the United States of America; The Prayer Book and the Christian Life.

Dr. Tiffany became a Fellow of the American Geographical Society in 1885, a Councillor in 1889, and Vice-President in 1893. He was always ready to do his part in the work of the Society, and he leaves with all those who knew him the memory of a noble character, happily endowed with the genial gifts that sweeten and beautify life.